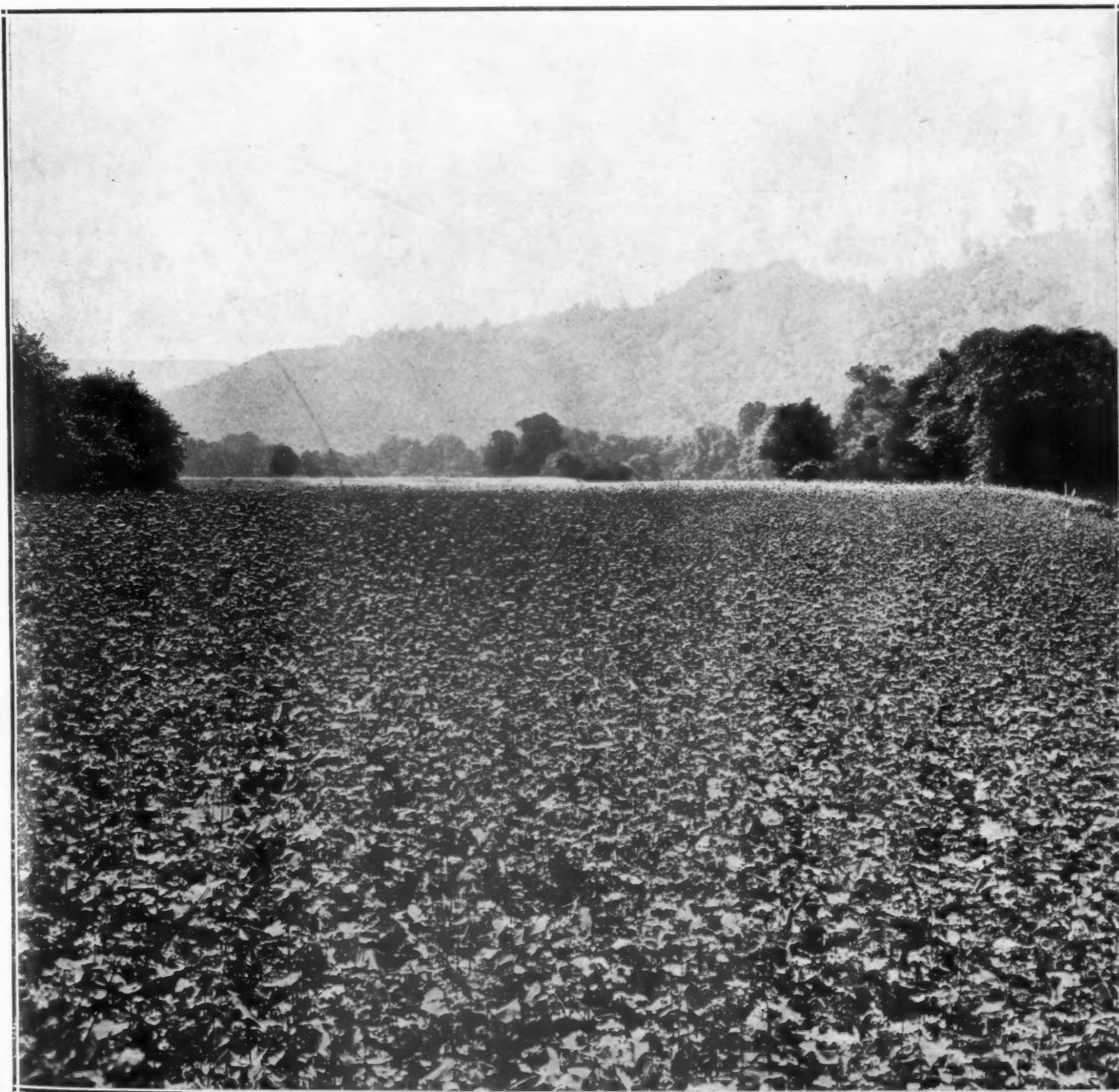


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SEPTEMBER, 1921



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DIAMOND MATCH CO., Apiary Department
CHICO, CALIFORNIA

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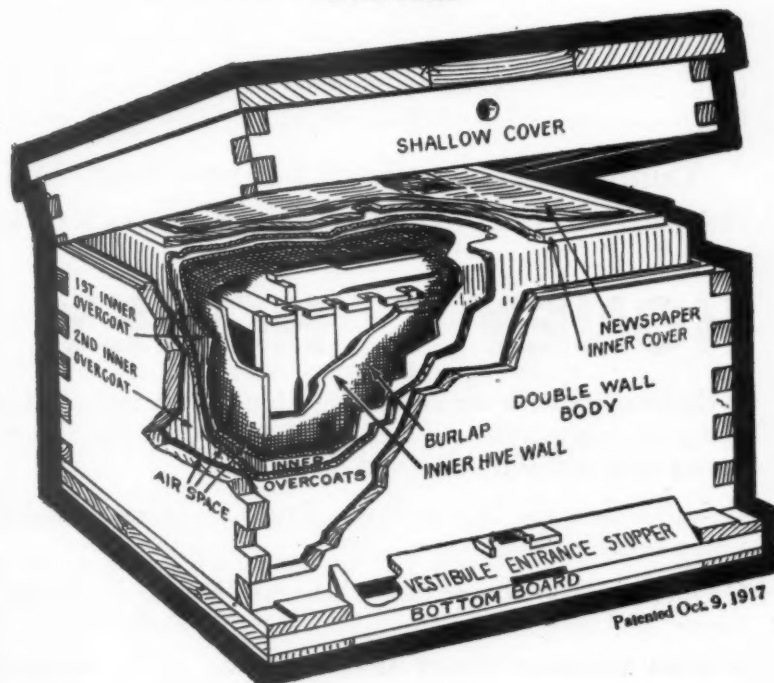


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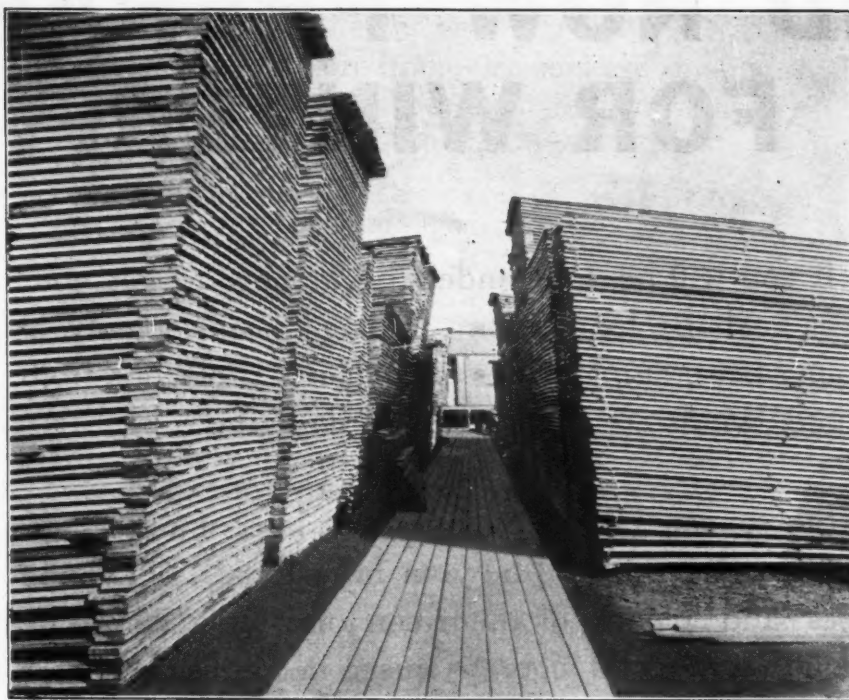
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VOL. LXI—NO. 9

HAMILTON, ILL., SEPTEMBER, 1921

MONTHLY, \$1.50 A YEAR

HONEY AREAS OF TEXAS ✓

Notes on the Principal Regions of the Lone Star State and Its Nectar-Bearing Flora—By H. B. Parks

THE flora of the State of Texas has been studied quite extensively. Published articles give the distribution of several of the major honey plants. No general account, however, has been printed. The State is so large that it embraces almost every class of flora. In the eastern part of the State the Mississippi flora is present. Beech, maple, linden, Virginia persimmon and others, give an eastern appearance to the forests. The southeastern part has the pine, palmetto, cypress and many other plants common to the southeastern part of the United States.

Central Texas possesses a flora all its own. The high lands of the west have the flora common to the Great Plains country. Southwest Texas is Mexican in its plant life. The lower Rio Grande Valley is almost tropical. Texas, west of the Pecos River, is mountain and desert. Yucca and cactus are the more prominent plants.

The State is naturally divided into several plant associations, the boundaries of which follow geological lines. The most of the State is new, geologically speaking. The great glacier did not touch this State, and little has occurred to obliterate formation boundaries. Thus the transition zone is very narrow, even in the case of the carboniferous and archæan. In fact, these zones are rarely over a few hundred feet wide. In this connection it is interesting to note that many plants are rapidly migrating to new locations under the influences of agriculture. Mesquite and retama are the best examples. Great areas that a few years ago were grassy plains are now covered with a dense growth of these shrubs. Post oaks are rapidly invading the coast prairies. These are cases of forestation rather than reforestation.

Each of these natural divisions contains its own nectar-producing plants.

No. 1, as shown in the map representing the cultivated area, is peculiar in that the most of the honey produced is accredited to introduced plants. Fruit trees and sweet clover are given as the main plants of value. Native annuals and certain trees, including linden, doubtless contribute much to the crop.

No. 2 is the River Valley area. Hard wood and pine forests, interspersed with swampy land, and their natural plant associations make a flora that it is predicted will some day become the equal of any for honey production. While there are a large number of bee owners here, modern

methods are almost unknown. Linden, tupelo gum, rattan, yupon (*Ilex spec*) and many other hard-wood plants are sources of nectar. Many swamp annuals, including smartweed, water lilies and pickerel weed, are known to give a surplus.

No. 3, the Gulf Area, is not so good for a bee location. Along the water courses yupon, wild peach and willow, together with the annuals, give the beekeeper good returns. In this division some horsemint is found and cotton yields at times.

No. 4, the Black Land Area. Both the horsemints are found in abundance. Gaillardia gives a spring surplus, while cotton gives the larger crop. In places a fall flow from smartweed and boneset is common.

No. 5, the Chaparral Area, is the commercial beekeeping section. Guajillo, catsclaw, mesquite, guayacan, granjeno, cactus and a large number of less known bushes are nectar bearing. Horsemint, cotton and a host of wild annuals add to the surplus. It is a notable fact that the newer the land geologically, and the less the nitrogen content of the soil, the larger per cent of leguminous plants. As the legumes are the best nectar plants, this area presents an unique location for the beekeeper. This section is famous for the water-white guajillo, or Uvalde honey.

No. 6, the Mesquite Plain Area, lies north of the chaparral, west of the black land, and east of the west plains. It is covered with mesquite, cactus, catsclaw and other semi-arid plants. Few bees are kept and honey flows are reported locally from catsclaw, mesquite, whitebrush and annuals. It is not probable that this section will ever become a honey-producing area. This is because of the fact that this area receives much less rainfall than the chaparral, which has almost the same plant association.



Black land Horsemint (*Monarda citriodora*).

Also the soil is of a very different type.

No. 7, the West Plains Area, reaches from the Oklahoma line south to the Pecos River. No large trees are present. Low, scrubby mesquite and hackberry are found along the water courses and canyons. The flora is much the same as western Kansas, Nebraska and the Dakotas. Very few bees are kept in this district, and unless some nectar-bearing crop like alfalfa or sweet clover is introduced in the future, the prospects for beekeeping are meager.

No. 8, the Trans-Pecos Area, is desert and mountain. The flora is very different from that of any other part of the United States. Plants of the yucca, century and cactus types predominate. Mesquite and its close relative, the screw bean or tornillo, are yielders of some honey. Catsclaw of several species are also present. The bee locations are isolated and far apart and are found in the mountain coves and at the heads of canyons. Very little detailed information is at hand on the minor nectar plants of this region.

Special Areas

The Alfalfa Areas. The largest one is found in the Rio Grande Valley, just below El Paso. The next is along the Pecos River, in Ward and the surrounding counties. Several other small ones occur along the Rio Grande, including the one at Laredo. While no data is at hand to the exact amount produced, it is safe to say that with the enlargement of these irrigated areas, which is bound to come, alfalfa honey will be near the head of the list of the honeys produced.

The Guajillo Area. Guajillo has various spellings, but has the common pronunciation of Wahea. The name is said to come from a Spanish word meaning a water bottle. Two explanations are given for the name, one that the rain and dew are long retained among its fine leaflets, the other that it is because of the copious supply of nectar. Guajillo is found only on the dry gravel ridges in the chaparral area. This plant gave the fame to Uvalde, yet it will be seen from the map that many other counties produce this fine water-white honey.

The Cotton Area. This area is co-extensive with the black land area. Within the outer boundaries given cotton sometimes gives a flow, but cannot be depended upon. Outside of the black land area and within the whole area given are small black land deposits, which are highly nectar producing. These are mostly located in river valleys and along the Gulf Coast.

The Horsemint Area. This area is very nearly the same as the cotton areas. The *Monarda citriodora* type of the mint being dominant on the black land and the *M. punctata* type on the grey, red and sandy soils.

The Mesquite Area. Like the cotton area, there are two divisions to the mesquite area. The heavy flows from this tree have all been in the central division shown on the map. The outside area sometimes gives flows varying in amount as one proceeds from the edge of the producing area toward the limits of the mesquite area. A very peculiar section is indicated on the east side of the producing area.

In this cul-de-sac, which includes the abrupt hills of the Edwards Escarpment, cedar and oak replace mesquite to such an extent that mesquite is only a minor honey plant.

The Edwards Escarpment, while not possessing a large number of honey plants, is the habitat of several species of sumac, which give a large flow of honey almost every year. The honey is amber and is not of a very high quality, but it finds its place in the general market, thus making beekeeping in these sumac locations profitable.

Many of the minor honey plants have distinct areas, but as these areas are included within a given plant association, these areas are not given. Bitter weed, while a honey plant, is a pest to the honey producer because of its dark amber, bitter honey. It is restricted in Texas to the territory east of the black land area and north of the chaparral.

WINTERING TWO QUEENS IN ONE HIVE

By F. W. L. Sladen
Dominion Apiarist

It is now three years since experiments with a system of wintering two queens in one hive were started at the Experimental Farm at Ottawa. The idea had its origin in the remarkably quick warming up of the spring in this locality, which, it was noticed, causes strong colonies to begin swarming during the honey flow from dandelion nearly a month before the honey flow from clover begins. This led to the belief that a larger number of bees could be raised in the time for the clover flow if two queens instead of one were wintered in the hive.

Experiments proved that this belief was correct. On June 1, 1919, in six hives of bees that had wintered two queens each, the capped brood on one side of the combs had advanced over an average approximate area of 1,100 square inches, each compared with 670 square inches in eleven regular colonies, and when the clover flow started (a week earlier than usual), on June 15, the advance was 1,330 square inches, compared with 840 square inches, respectively.

The honey taken from the 2-queen hives in 1919 averaged 189 pounds each, compared with 178 pounds each from the regular colonies. The yield from the 2-queen hives would have been higher had it not been for the fact that they had their queens removed at the beginning of the clover flow, which caused some loafing, while the regular colonies were kept from swarming by having their queen-cells destroyed every week.

The two queens were separated during the winter by a close-fitting thin division board, placed in the middle of the hive, so that actually two small colonies were wintered in each hive. One of these colonies was placed in a separate hive in late spring. The best time for making the separation was found to be early in the honey flow from dandelion.



Plant Regions of Texas—No. 1, Cultivated area. No. 2, River Valley. No. 3, Gulf Prairie. No. 4, Black Land. No. 5, Chaparral Area. No. 6, Mesquite Plain. No. 7, West Plains. No. 8, Trans Pecos.

The original plan was to prevent swarming during the clover flow and get the two young queens raised and established in the hive in two operations only, (1) the removal of the old queen—early in the clover flow, and (2) not more than ten days later the destruction of all the queen-cells except two left or given as ripe cells raised from selected parentage, one on each side of the division board then inserted. Fixed in front of the hive was a special portico which separated the outer entrance for each queen by about ten inches. The result was that a considerable proportion of the colonies had both queens safely mated.

A large number of young bees for the winter were raised by the two young queens and the number of the colonies was increased from year to year. There was no swarming before the clover flow, because the colonies were not then strong enough to swarm.

In 1920 an improvement was introduced which consisted of treating only those colonies that showed that they were preparing to swarm by having larvae in the queen-cells. In this way honey production was increased further, but the number of hives having two queens for the winter was reduced. This made the system applicable to places that have less favorable spring conditions for the colonies to build up because the weaker colonies were strengthened with brood from the stronger. The colonies were examined every eight or nine days for queen-cells, but it is believed, as a result of the 1920 experiments, that a 10-day period would be better, both for repeating the examinations and for the destruction of the queen-cells after removal of the queen, especially if, as a precaution against swarming, the queen's wings have been clipped. As ten days is also the time it takes for a batch of queen-cells to become ripe from the time of starting, the apiary need be visited only once in every ten days during the swarming season, which is satisfactory for out-apiary work.

1920 was a poor year for honey at Ottawa. From eight hives, in which two queens were wintered, in four of them an average of 75 pounds of honey were taken, against 68 pounds from six regular colonies.

The above experiments were carried out with hives containing ten Langstroth-sized frames. Much better results were obtained in 1920 from two 10-frame Jumbo hives, strong in bees, wintered outside in a 4-colony case with two queens each. They each produced an average of 147 pounds. This was more than double the production from the regular colonies in 10-frame Langstroth hives.

Further developments foreshadowed are (1) the introduction of two young queens mated in nuclei in place of the two queen-cells in treating some of the colonies, including all those that are treated late, and (2) not inserting the division board until fall, when five of the combs are removed, and another colony, reduced

to five combs, is placed on the other side of the division board. This latter plan reduces the system to a method of halving the space occupied by colonies in winter, so that, in wintering outside, each 4-colony case will hold eight colonies, and in cellar wintering only half the number of hives are brought into the cellar. This is a good plan where no increase is desired. The advantages of wintering two colonies in one hive in the cellar have been discussed at length by the late Dr. C. C. Miller in his book, "Fifty Years Among the Bees." This author says that if he "had not changed from 10-frame to 8-frame hives" he "would have continued the practice."

Wintering two queens in one hive as a regular system can hardly be recommended to beginners, nor for localities in which the main honey flow follows soon after the commencement of swarming, but the success of the experiments at Ottawa indicate its possibilities in the hands of experts where the spring conditions are favorable.

The experiments show that there is no difficulty in wintering two queens in one hive when the bees accompanying each queen cover four or five combs. Not one of the double colonies was lost, even including two 10-frame Langstroth hives wintered outside in a 4-colony case. The great value of a few spare young queens in spring and the difficulty there is in procuring them when required and in good condition, and in introducing them safely, makes it very desirable that moderately weak colonies containing young queens, instead of being united in the fall, should be placed, in pairs, in hives separated by a close

fitting division board, so that both queens may be saved. Every beekeeper should have a few of these division boards for this purpose.

Canada.

WORKER BEES IN DRONE CELLS

By Edward A. Winkler

Question.—Some time ago I neglected to put enough frames in a colony of bees and they filled the space with a comb of their own, but it happened to please them better to build drone-comb.

I ran across it several days ago and cut it out and threw it in the honey house. I was surprised to find it covered with young worker bees this morning, when I thought it was drones.

If you examine it you will find worker bees in drone cells. This is something I have never seen before and may explode some of Darwin's theories.

Illinois.

Answer.—No. This will not damage any of either Darwin's of Dzierzon's theories. We have seen queens lay worker eggs in drone cells when they had no other cells at their disposal. This experiment was made by supplying a hive of bees with all drone-comb. But, in that case, the bees narrowed the mouth of the cells to worker size. It was perhaps done in this instance also. However, it would indicate a young queen, for old queens do not have so much repugnance to laying in drone-cells as do young queens.

Huber, who lived before the Dzierzon theory was advanced, and wondered how it was that an unimpregnated queen or a worker could lay eggs that would hatch, had noticed that a young queen rarely lays any drone eggs before she is at least 11 months old. He thought that the male and female eggs came in turn, and often wondered how a queen could tell when the eggs that she was about to lay would be drone eggs. All that was explained by the Dzierzon theory of parthenogenesis, to the satisfaction of the scientists.

However, your experience, in this matter, is quite interesting.—Editor.)

PEOPLE IMMUNE TO STINGS

By J. H. Tichenor

I have just finished "eating" the book, "The Dadant System of Beekeeping." It is practical common sense. No one can read it and think just the same as before. It will change his ways for the better. There is just one thought presented in it with which I differ, and I deem it of so much importance that I feel in duty bound to mention it. The writer seems to convey the idea that there are persons immune to bee stings.

During my lifetime of 58 years, I have known at least four or five of those sting-proof people who came near losing their lives by stings. I have, therefore, concluded that it is not best to get anything in print that might lead to carelessness in handling bees.

Wisconsin.



Bitterweed.

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MAURICE G. DADANTBusiness Manager

THE EDITORS' VIEWPOINTS

Everlasting Beehives

An Italian beekeeper, Carlo Caldarelli, has invented a hive, made in double walls, with air space, which he has patented and which seems to be made of asbestos cement, apparently similar to the Johns-Mansville roofing shingles. He calls it "L'arnia di eternit," the hive of eternity. Undoubtedly such a hive would last many years and wear but little. Whether it would be suitable for a climate as changeable as that of North America remains to be ascertained. The following advantages are claimed for it:

It is a better non-conductor of heat and cold than wood, though not so good as cork; it cannot burn up, and resists heat well; it stands moisture, withstands frost, and it is practically unbreakable. The price per hive is 135 lire, which, at the present exchange, would figure about \$6.60. The material is very thin, only about 4 millimeters, but the dead air space, which might be filled with non-conducting material, helps in the insulation of the walls. As wood is very high priced in Italy, this hive may succeed, if faults do not develop.

Lavender Sticks

We are in receipt from Mr. Wm. Mahler, Lafayette, Ore., of two very pretty "sticks," made by his "missus." They are made of a couple dozen lavender stems, intertwined with blue ribbons and red cord, giving a very pretty effect. The odor is exceedingly sweet and we can readily understand the use of lavender in linen drawers, especially in this shape. Since the lavender is recommended as a honey producer, it may be worth while to cultivate it.

Unedited Letters of Francois Huber

I had for many years the desire to engage in the translation into English of the "Unedited Letters of Huber." Mr. Ed. Bertrand, who published them in the original French, in Switzerland, in 1891, often urged me to undertake this. But the task was great and I did not have the time to spare. I have at last accomplished it, leaving out only such letters as contained repetitions or were uninteresting to beekeepers.

Is it necessary to mention the

great value of Huber's observations?

Very few beekeepers have failed to hear or read of the great naturalist, whose "First Observations on the Natural History of Bees" were published in the English language in different editions, from 1806 to 1841. He enriched the public mind with a number of observations, very few of which have proven incorrect. He is quoted favorably by most of our leading apiarian teachers, and, to mention only those leaders who wrote in English, we find him praised by Bevan, Cook, Alley, Cheshire, Cowan, A. I. Root and, above all, by Langstroth, who called him "the prince of apiarians." Even his antagonists have added to his fame. Huish, whose work on bees was published in London, in 1815, and who was therefore a contemporary of Huber, ridiculed Huber's experiments and observations and called them "absurdities." Huish denied things that Huber had proven, he denied that the queen was fecundated in the air, on the wing; that wax was produced by the digestion of honey; that pollen was used to feed the brood, and many other facts which are now well proved. So Huber has remained as one of the leading lights of modern beekeeping, while Huish is well-nigh forgotten.

Since the "Unedited Letters" were gathered together by our late friend and published by him originally, we believe it is well to begin by publishing his "Introduction," as given in presenting the Letters to the public. This was done in 1897, and the Swiss edition was exhausted long before the death of Mr. Bertrand. We will publish these letters from time to time, as occasion offers, in the Journal.

Our readers must not expect anything positively new, in natural history, through the publication of these letters. But they will see the habits of bees under a new light and will perhaps recognize discoveries which they know now but faintly. Huber's style was delightful and I hope I may have retained some of this delight in the translation.

C. P. Dadant.

Organization

The beekeepers of the United States probably lead the world in

honey production, but not in organization. Read the statement of "L'Apiculteur Alsacien-Lorrain" on beekeeping in the liberated provinces:

"Nearly all the beekeepers of the liberated provinces are grouped in the branches of the Society of Beekeeping of Alsace-Lorraine. This numbers at present about 12,000 members, who own about 80,000 colonies, nearly all with movable frames. The average crop is of about 10 kilos (22 lbs.) per colony, or 800,000 kilos (1,700,000 lbs.) annually.

Beekeepers of America, if you want to achieve anything in the sale of your honey, you must be united, as these people are. But thus far, the beekeepers who belong to associations, in this country, are only a small minority. We need better organization. Don't fail to join the leagues of honey producers. They will be efficient only in the proportion that their membership will hold to the total number of honey producers.

A Bee Paper for South Africa

We have before us the first two issues of the South African Bee Journal published in April and May.

This journal is the official organ of the South African Beekeepers' Association, whose official address is Box 6057, Johannesburg. The magazine promises to be of great help to the beekeeping industry there.

Nuclei by Parcel Post

An advertiser of bees and queens calls our attention to the fact that he is urged by customers to send nuclei by parcel post. This he is unable to do, since postal regulations are very explicit that only queens with attendants in the regulation mailing cages and bees in packages without combs and with double wirecloth sides may be admitted to the mails.

The fact is that probably a good many such nuclei have been sent by parcel post through lack of knowledge of the rules on the part of the customer, the shipper, and the postmaster.

This infraction of the regulations should be done away with. We are likely sometime to have such a nucleus broken open in the mails with much damage done and a consequent liability of the shipper, endangering the whole business of shipping package bees by parcel post.

Certainly the time should come when nuclei may be admitted, but until such a change is made, we had best abide by the regulations.

Honey Versus Sugar

Concerning the comparative value to the human body of sugar and honey, which is discussed by Dr. Carton in his "Treatise of Medicine, Alimentation and Hygiene" quoted in the present number, it is well to remind the readers that Dr. C. C. Miller, who lived to his ninetieth year, in full use of all his faculties, used no sugar, and sweetened his coffee, tea or other drinks, with honey instead of sugar. There is no doubt that the

sweet of the blossoms, as produced by nature, is superior to our artificial sugars, although cane and beet sugars are very much superior to the corn syrup made by the chemical action of sulphuric acid upon starch. We should use more plentifully of honey and advise all our friends to do the same, knowing that we are thus to secure better health and longer life. Pure honey contains the most fragrant and delicious, as well as the healthiest properties of the vegetable kingdom. Think of manufacturing milk by some chemical process and expecting it to be as healthful as that which is produced naturally in the udder of the cow! The milk of our cows is an essence distilled from the sweet plants of our pastures, by Nature. To quote a noted French songster: "Milk contains more science than all the books of the metropolis." Similarly, is not the honey, gathered by our bees, distilled from the sweetest blossoms by a process that no chemical invention can ever imitate successfully?

A German Bee Book

Through the courtesy of Professor Alfonsus, of Vienna, we have received the book, "Unsere Bienen," by August Ludwig, the second and complete edition of which was published in Berlin in the late Autumn of 1920.

Written by so eminent an authority as Pfarrer Ludwig, who is one of the instructors in beekeeping of the Zoological Institute at the University of Jena, the volume makes a very valuable addition to our library.

The book, comprising 760 pages in all, with 474 illustrations and 28 plates, part of them in colors, is divided into two parts, the first dealing with the Science of Beekeeping and the latter with Beekeeping Practice.

Chapters considered in the first part are briefly as follows:

1. The Significance of Beekeeping.
2. Hypothesis for Successful Beekeeping—Honey Plants, Climate, Weather, the Beekeeper Himself.
3. History of Beekeeping from the Ancients to the Present Day.
4. Writings on Bees and Beekeeping.
5. Bees in Fiction—Customs and Folklore.
6. Natural History of the Honeybee—Races of Bees, Comb-building, etc.—Diseases and Enemies.

The second section, dealing with Practical Beekeeping, comprises 416 of the 760 pages of the book, and has for its chapter subjects the following:

1. The Beehive.
2. Tools for Beekeeping.
3. Care of Bees.
4. The Bees' Products and Their Profitable Harvest.
5. Bookkeeping in Beekeeping.
6. The Bee Association, Its Function and Duty.
7. The Beekeeper's Rights and Laws on Bees.
8. Instruction in Beekeeping.

We Americans are undoubtedly in the front rank in beekeeping practice and more especially in profitable management of bees on a large scale, but many of our European contempora-

ries have done more detailed work, especially in the natural science of beekeeping, as is evidenced by the above mentioned work.

Nor is the study of the practical side neglected by them, although possibly not put into use according to our ideas. We find nearly every type of American hive described, illustrated and discussed, in this volume.

A valuable addition to the library of any beekeeper having a working knowledge of the German language.

Wisconsin Bulletin on Foulbrood

Bulletin No. 333, of the Agricultural Experiment Station at Madison, Wis., 24 pages, 9 half-tone engravings, is before us. It has for its title "How to Control American Foulbrood," and was written by Prof. H. F. Wilson, who is in charge of bee investigation and disease eradication at that University.

The bulletin begins by giving appearance and symptoms of European and American foulbrood, and of sacbrood, and continues with a more complete description of American foulbrood, its eradication and cure.

Warnings are given to avoid buying brood combs unless sure of their safety, and of the necessity for disinfecting by boiling in hot lye all second-hand equipment. In eradicating the disease, bees should be brushed instead of being shaken, and this should be done in a honey flow.

Extracting combs removed from a foulbrood colony should not be used again, though apparently safe and dry. Experiments made show that there is a 25 per cent chance of re-infection from this source.

Nor does Prof. Wilson deem it advisable to use the plan adopted by some of leaving one dry comb in the hive to catch the infected honey, the same to be removed the next day. He argues that by that time the bees may have drawn out foundation and may transfer some of the honey from the old comb to the new ones.

Bulletin on Swarm Control

Farmers' Bulletin No. 1198, of the U. S. Department of Agriculture, has for its title "Swarm Control." It comprises 48 pages and was written by George S. Demuth.

Designed for general distribution to all keepers of bees, it is not only a manual of instruction, but a thorough discussion of the underlying principles governing swarming and swarm control as well.

The desirability of swarm control is self-evident to the experienced beekeeper. The reading of this bulletin should make it so to the novice.

Although the causes of swarming are not definitely known, some of the factors influencing the tendency to swarm are:

1. Hereditary influence through lack of breeding from desirable stock.
2. Wrong size and shape of brood-chamber and poor combs.
3. Improper distribution of bees within the hive. Mr. Demuth outlines some of the most important considerations in swarm prevention meas-

ures as being: selection of stock in breeding, large brood-chambers, good worker combs, free expansion of the brood nest in spring, wider spacing of combs, deep spaces below the combs, large entrances and additional ventilation if necessary, proper shading, prevention of building of barriers of sealed honey in the brood nest; inducing bees to occupy supers, and empty combs for the ripening of incoming nectar.

A part of the bulletin is devoted to instructions in case of swarming, relation of prime swarm and afterswarm to the parent colony, and manner of treatment to anticipate swarming.

The text is illustrated with several drawings, mostly showing different arrangement of hives and supers in hiving swarms and in swarm control.

Boost Your Local Sales

Questionnaires sent out by the Texas Honey Producers' Association reveal the fact that only two per cent of the honey of members is sold locally. Probably a condition which is general through the country, and especially in the larger producing districts. Surely there is no good reason why this could not be increased five fold with a little effort in stimulating local sales.

Northern Ontario

The editor of "L'Abeille," of Quebec, Mr. C. Vaillancourt, gives in this magazine a description of the Abitibi region, located about 200 miles north of Georgian Bay, which he reports as a fast growing settlement in which clover grows abundantly. This is a newly settled region, the streams of which run towards James Bay. It is said to produce the willow-herb or fire-weed in large quantities.

Conventions

Perhaps fifty conventions of beekeepers have been held within the past thirty days. Not many years ago a bee meeting was sufficiently rare to be worthy of extended notice in the magazines devoted to honey production. Now it is impossible even to give the place and date of them all. Hardly a day passes without such a convention being held at some point on the North American continent. This indicates a better state of the industry. While from the census we learn that there are less people keeping bees than was the case formerly, there are more specialists, and it is the specialist who develops an industry. We learn much from each other, and the personal contact at these meetings, large or small, adds much to the interest as well as pleasure of one's work.

Lime Soil for Sweet Clover

At the Chippewa Falls meeting, Dr. Phillips made it clear that a soil containing plenty of lime is absolutely necessary to produce sweet clover freely and that this plant is not a good honey yielder in any soil but a lime soil.

THE PACKERS' PROFITS

Notes on the Cost of Packing and Selling the Honey Crop
—By M. G. Dadant

MORE and more, in these days of reconstruction and of revision, we hear criticism of the jobber, of the wholesaler and of the retailer, and an urgent demand everywhere for the elimination of the middleman.

Before discussing specifically the case of the honey producer and honey seller, a frank elaboration upon the "middleman" seems advisable.

In the earlier days, the middleman was a negligible quantity. Either the head of the family produced all the family required or else he bartered with his neighbors—a case of from producer to consumer. By and by, modes of travel and of intercourse were established, the bartering became more general. By gradual development we came to a period when the head of the family depended for many things upon exchange with neighbors or with distant peoples. This was true as far back as the time of the Phoenicians, a flourishing people, devoting their time to trading along the shores of the Mediterranean and even in the countries of northern Europe.

Eventually was evolved the present period of specialization, where many men spend their whole lives in one single pursuit, exchanging the result of their labors for commodities produced by the labor of others, in this country or in far-away foreign lands, with middlemen to execute the exchange, trading coffee for honey, or shoes for raw hides.

So specialization means middlemen, and the greater the specialization, the more middlemen required, most certainly with all the opportunity for incident evils, but not without compensating advantages.

Moreover, the more middlemen, jobbers, brokers, wholesalers, packers (or whatever you are minded to call them), we can interest in the handling of a given commodity, the greater the competition among them, the less profit they will take and the better distribution they will give us. Arguing on this basis, and for our own selfish interests, we should encourage occupation of as many middlemen as possible in distributing such a commodity as honey. Not that it is better for the distributor, but rather that it is better for us, the producers, or the consumers. They bid up on buying, they attempt to underbid each other on the selling.

If each individual producer endeavored to sell his own products direct in these days of specialization, he might succeed if his output were small, but, with more than he could dispose of locally in a small way his costs of marketing would become excessive, in fact far above those of the individual who made a business of trading. The smaller producer may dispose of his crop, the larger must

leave the sales to a class who devote their entire time to it.

The mere fact that there are profiteers among the jobbers, etc., should not blind us to the fact that we cannot do without the whole class. The profiteer should be eliminated, and I believe that this is appreciated as much by the honest and conscientious middlemen (who are in the large majority) as by the producer and the ultimate consumer.

Turning now, more specifically to honey and honey prices, I have been fortunate in getting from the different honey packers, figures on the items that enter into the retail price of honey—what proportion of the retail price paid goes to the producer, how much is distributed along the road to the handlers, how much for labor, freight, containers, labels, leakage, losses, etc.

An average of these figures, which were slightly variable, but in all cases within comparatively close range, is shown in the accompanying table:

*Size of Package	Honey Cost 10c Lb.	Materials Cost Case Labels	Overhead Packing, Selling, Office, Freight, loss of Honey	Packers Profit 6% of Ultimate Price	Jobber's and Wholesalers Gross Profit and Ft.	Retailer's Gross Profit Ft. and Ft.	Price to Ultimate Consumer.
6 oz. jar....	4.5c	3.6c	2.7c	1.1c	1.8c	4.3c	18c
16 oz. jar....	10c	6c	8c	2.4c	4c	9.6c	40c
2½ lb. can....	25c	7c	10c	4.2c	7c	16.8c	70c
5 lb. pail....	50c	12c	10c	7.2c	12c	28.8c	1.20
10 lb. pail....	\$1	22c	13c	13.5c	22.5c	54c	2.25

In all instances, in order to get a working basis, honey at 10 cents per pound, f. o. b. packer's station, was used. Cost of packing materials are fairly constant and vary only with the distance of packer from his source of supply.

The item of overhead, including as many items as it does, and based on specific cost sheets, though large on the larger packages, is well within

reason, as is the packer's charge of 6 per cent profit.

There only remain the profits of jobber and retailer, which alone make up 34 per cent of the whole. These do look large. Bear in mind, however, that these are gross profits, from which must be deducted freight, handling, damage, delivering, interest, etc. One point which might go to show that these two classes are not getting an excess is that so very few wholesalers and retailers handle honey. Were the profit excessive there would be an inducement to push honey rather than other syrups. The reverse is usually the case. Why? Is the margin of profit larger in other syrups? Possibly it is the cheaper price. More likely it is the better distribution and the better advertising. The syrup people spend millions on advertising. How much has been spent on honey?

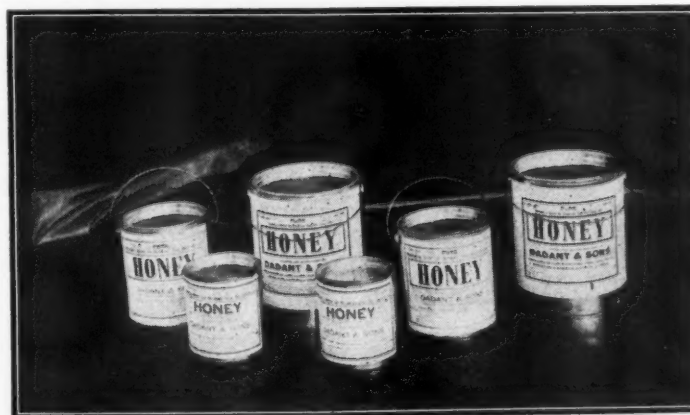
The small individual honey producer will assure us that the prices figured are too high, that he can sell cheaper. But can he afford to sell cheaper? Has he figured his costs? What does he charge for his time? If he sells 500 pounds of honey in 10-pound cans, can he put it up as cheaply as one who cans honey day in and day out with modern equipment? There are many items which the small producer will avoid, but will not his heavier expenses for containers, selling, etc., offset this, if figured on a real cost basis?

The farmer no longer butchers his hogs and cattle to sell. He cannot afford to. His distribution costs would be too high. He specializes in production.

What, then, can be done to stabilize the sales of honey? Wherein is the present honey-selling industry suffering?

In the first place, there is a lack of co-operation. Not only is this true as between the individual beekeepers, but also as between the producer and the honey packer and honey seller. I may be selling my honey in 10-pound cans at \$2.25, whereas my neighbor sells for \$1.00. I may be selling at \$1.50 while the packer will have to ask \$2.50 to make a normal profit.

Under these circumstances honey sales are bound to suffer; the consumer who buys my neighbor's honey



Friction top pails, attractively labeled, make ideal containers for local sales.

at a low price, even though poorly put up, is less apt to take mine later if the price variance is so great. The same is true as between the producer's and the packer's brands. The result is that the market will likely be bare during a portion of the year, the higher price honey seeking a market where the cheap competition is lacking.

Co-operation should tend to establish an approximate uniform price—competitive, of course, but near enough so that a lack of supply of honey of one source could be offset by fresh supplies from another source, thus keeping the market constantly supplied.

We lack advertising—publicity. How much does the average person know about honey? How many even know that there is such a commodity as honey available? Advertising costs money, but we must agree that it brings results. How else can we justify the enormous outlays represented by only one month's publication of our national magazines? I venture the assertion that an outlay of one cent per pound for honey advertising would enable an increase of four cents per pound in the selling price of honey, if indeed the beekeepers were able to supply the demand.

Thirdly, we lack distribution. Many communities now would buy honey were it available. One town may be so well supplied that no outside honey is required. In a neighboring town, either there may be no local beekeeper, or else he sells all direct to the jobber and the town is honey dry.

Possibly, also, the honey industry is suffering from lack of specialization. Might it not be better to devote our whole time to production, as the beef cattle men do, and leave the packing, advertising and distribution to the middleman? We would suffer periods of depression, as the cattlemen do today, but we would get national distribution.

In conclusion, there are three ways open. We may go on as before, some cheapening the market by selling low, others endeavoring conscientiously to hold it up to a normal level; the packer grabbing what he can under the circumstances; or we may ignore

the packer altogether, co-operate and handle as a class, all of our own production, advertising and distribution; or we may, last of all, co-operate as between ourselves and as between producer and jobber—sell all we can at a good stiff average price and urge the jobber to get in where we leave off, aid and, if possible, duplicate his advertising, further his distribution and encourage as many of them as possible.

To my mind, under present conditions, the last road is the proper one.

THE IDEAL BEE

By John Prothero

American textbooks, published in recent years, seem to take for granted that the Italian bee has established its reputation as the best. They appear to regard the matter as finally settled. Several pages are usually devoted to praising this race and advocating universal Italianization; the others are cursorily mentioned and dismissed. Superiority is claimed in nearly every quality and attribute of bee excellence for the Italian, and statements are made which many foreigners would challenge. There is a strong probability that the strain found best in Florida would not be best for high altitudes in Montana and Idaho. May not the excessive swarming propensity of Carniolans be due to placing Alpine bees on hot plains? Does not the whole question require revision?

As in all live stock, there is an ideal bee, the type which shall combine the good qualities of all known strains. Of course, we shall never produce it; it will remain an ideal; but, in pursuing it, we shall undoubtedly arrive at a better bee. The process should be that which is best exemplified in modern poultry breeding. We want to breed certain qualities into one strain from another. In making this cross, we introduce some undesirable qualities, which we then proceed to breed out again. It is a long business, with many intermediate stages, and throw-backs will insist on breaking out just when the final result seems attained.

I was once consumed with an ambition to originate a new breed of dog,

the Dalmatian-Dachshund. Dalmatian coat on Dachshund figure, a long, low, lizards creature, white, dabbled with black spots, like raisin bread. Everybody to whom I mentioned it showed the utmost enthusiasm for the project and hastened to bespeak the pups. Other interests supervened, and the D. D. never materialized; it has remained an ideal. I am now advocating a less showy but more useful experiment in cross breeding.



Tall-16 oz.
Capacity 16 oz.
Screw Cap Jar.

Poultry breeders have done marvels in producing new and improved strains. Perhaps Darwin, with his patient experiments in pigeon variations, pointed the way for those who, without any theory to prove and with purely material objects in view, have originated breeds combining the qualities of several older ones and moving towards an ideal type. Generations follow one another so rapidly that much can be done within the span of a few years. The poultry men have shown beekeepers what can be done and what ought to be done.

Ah, but the drone difficulty! The drone is certainly a difficulty, but he does not amount to an impossibility. The solution lies in isolation. A ring of outapiaries, making a rough sort of circumference to a central queen-yard, is usually a sufficient insurance. There are islands available, too, though this would be more a task for the Department of Agriculture than for the individual breeder. Still, we must not wait for the happy day when a generous appropriation will maintain an isolated queen yard, devoted to the production of improved bees. Mr. Barratt, of Sheffield, England, has produced some startling results by means of hand fertilization, but this is never likely to get beyond the stage of interesting experiments by experts. The breeder will have to do his best and risk the drone.

Breeding, up to the present, has been confined to the improvement of particular races. Penna, Piana and Bozzalla are developing the leather-colored Ligurian, the dingy cousin of our bright Italian bee. Jan Strgar is developing perhaps the most promising material in the world, the Carni-



The parcel post package is as yet little appreciated.

olan bee. The Swiss are devoting themselves to the black Alpine bee; the British to the brown Dutch; and there are breeders in Egypt, Cyprus and elsewhere, producing queens of native stock.

In this country queen-breeding and selection have been carried to an extent and a nicety of practice unknown elsewhere, but little has been attempted, as yet, in the province of hybridizing. The rage for bright golden color seems to have died down, and the Italian three-bander is the bee of the moment. I have been one of those bee-fever patients who try everything going. I have handled at least ten American strains and, in addition, Carniolans and blacks. I am by no means satisfied that the best strains of three-banded Italians cannot be improved. I have never handled any Italian strain whose temper, throughout all seasons, could compare with that of the Carniolans, nor whose power of building up rapidly in chilly spring weather could compare with theirs. I have handled a strain of black bees which never did anything that the textbooks say they do. Their deportment was always calm and sedate. They were early abroad, and did not sulk in cool, cloudy weather. The Carniolans were worse swarmers than even the textbooks foretell—in early summer—but afterwards settled down and did marvels. Their bad point, I should say, is that the fuss they make, when swarming, upsets Italians in the same apiary; they corrupt respectable neighbors with their mania, but do not communicate their virtues. The blacks were the equal of any Italians I have handled, and were conspicuous non-swarmers, but their queens were hopelessly invisible. Yet I feel sure that Carniolan temper and fertility and black hardness will ultimately be among the attributes of the ideal bee.

The first task should be to breed the Carniolan temper into the Italian three-bander until it becomes constant, and color bands remain invariable—until you get a permanent hybrid, and not a mere cross. Then, should this hybrid show swarming fever, get rid of it by selection, or by a further admixture of Italian blood. There will remain an interminable vista of further tasks confronting the breeder, but this first step, that of introducing the temper and fertility of the Carniolan into the present American-Italian, is one that should allure amateur and professional alike, for it will mark an undoubted stage in the advance towards the ideal bee.

Virginia.

(The greatest fault we find with the Carniolan is its lack of definite markings. A slight mixture of them with the common bees is impossible to distinguish, while the slightest mixture with the Italians shows itself at once. But our correspondent is certainly correct in saying that the strain suited to Florida might not be the best for high altitudes. We have tried practically all the different races, and by all means prefer the Italian.—Editor.)

UNEDITED LETTERS OF HUBER

Introduction

By Edouard Bertrand

The "New Observations upon bees" of Francis Huber make very interesting reading. When I resolved to read them, however, I did not anticipate the intense pleasure which they gave me.

Indeed, if there are still literary productions of the late eighteenth century that are read, we know in how small a proportion. Hardly one book in ten thousand has withstood the test of time. What a lesson in philosophy and what a menace towards the future of our contemporary works! Concerning works of science this proportion is still more disastrous. Everything has changed, everything has been perfected in so speedy a manner that the recital of information dating back a century generally offers no interest for us. From the enormous accumulation of scientific works of that time, there are few capable of instructing us yet; and they are nearly all on Natural History. Among this elite, the "New Observations" of Huber shine with a particular éclat, with an ensemble of qualities so harmonious and original that we would seek them vainly elsewhere. The charm of a style which is always pure is allied with a very simple and yet very clever expose; the ingenuity of the observations is so extraordinary that one soon gives way to the sentiments of an aroused admiration for this blind man, whose genius was at all times equal to well-nigh insurmountable difficulties.

I.

Francis Huber, born in Geneva in 1750, died in 1831. * Note.

When he became blind he was engaged to a Miss Aimee Lullin, and this young lady was faithful to him, in spite of contrary advice which was given her. She was to be rewarded for it by the happiness of her entire life.

Huber narrates himself (New Observations, page 1) how he became interested in bees. He was fond of sciences and did not lose this fondness when he lost his eyesight. He had his servant, Francis Burnens, read to him the best works on physics

Note—His father, Jean Huber, had the reputation of being one of the wittiest men of his time and was often cited by Voltaire, who appreciated his conversation; he was a pleasant musician, wrote poetry which was even praised in the Ferney drawing rooms, was known for his quick piquant rejoinders, was an easy and talented painter, excelled in the art of cutting out paper landscapes in such a manner that he appeared to have created this method, carved better than an amateur sculptor, and to these talents he added the taste and art of animal study. His work upon the flight of birds of prey is even now referred to with profit by naturalists. Jean Huber transmitted most of his tastes to his son. (From the notice of P. A. De Candolle upon Francis Huber.)

and natural history. This man took great interest in these readings and Huber quickly noticed his wonderful aptitude as an observer. He resolved to cultivate this talent, and caused him first to repeat some of the most simple experiments of physics. These he executed with a great deal of skill, improving upon the few instruments that were intrusted to him, applying them to new uses and even making, himself, the implements which he needed.

"The continuation of our readings," says Huber, "having led me to the beautiful works of Mr. Reaumur upon bees, I found in his book such a fine plan of experiments, observations made with so much art, a logic so wise, that I resolved to study particularly this celebrated author, to shape my helper and myself at his school, in the difficult art of studying nature. We began by watching bees in



Huber, the blind Naturalist

glass hives; we repeated all of Reaumur's experiments, and we secured exactly the same results when we used the same processes. This agreement of our observations with his gave me great pleasure, because it proved to me that I could rely entirely upon the eyes of my helper. Emboldened by these first trials, we attempted to make upon the bees some entirely new experiments; we contrived the building of several hives, of which I had never thought, and which presented great advantages, so we had the good luck of discovering remarkable facts which had escaped the notice of Swammerdam, Reaumur and Bonnet. It is these facts which I now publish in this work; there is not one of them that we did not try several times over, during the eight years in which we made researches upon the bees."

This modest expose retains surprises for the reader, for it does not give a presentiment of the importance and of the difficulties of the researches which followed.

Francis Burnens was not only an intelligent man, he was gifted with great tenacity. He often would follow, for 24 hours, without food or rest, the actions of a few worker-bees

which he suspected of being fertile, in order to detect them while in the act of laying. Once, even, he spent 11 days examining the bees of several colonies, one after another.

Huber directed the experiments and devised them so as to retain the control. Nothing is more interesting than this association, which lasted too short a time, for in 1795 Burnens left him to live at Oulens, where his fellow citizens, aware of his capacity, made him a magistrate.

On the other hand, he did not cease his bee work, and from time to time he replied to the requests of Huber by additional experiments. I have had the good luck, through my friend Mr. Edw. Pictet, to publish one of those letters of Burnens, in answer to a question upon the sphinx atropos (*Revue Internationale*, 1885, page 85). A footnote of Huber, in communicating this letter to Mr. M. A. Pictet, of the Academy of Geneva, shows what sentiments Huber had towards Burnens.

"You will see that the writer of this letter has what is needed to become an excellent observer—good eyes and good logic. You will acknowledge that it is a pity that an instrument which I had sharpened be no longer in my hands. Burnens is justice of the peace at present (*New Observations*, Preface); he does not waste his time; his entire life is being spent in preventing his fellow countrymen from eating out one another's white of the eyes' and ruining themselves in law suits. I had not thought that my lessons would put him there. His observation is very important. It proves that bees, which contract the entrances of their hives when they are threatened with invasion, do not do it when it is unnecessary. It is therefore the circumstances which prompt them; they never make any mistake."

The first edition of the "Observa-

Note. Pierre Huber, the son, was himself a naturalist of merit, already known through his "Researches on the Habits of Ants," published in Geneva and in Paris in 1810, and republished in 1861. Here is the list of a few of the bulletins which he published in periodical works: "Memorandum on Divers Instruments of Physics and meteorology" (*Society of Physics and Natural History of Geneva*, Vol. 2). "Notice Upon a Migration of Butterflies" (*Ditto*, Vol. 3). "Memorandum to Serve Upon the History of the Caterpillar of Hammock" (*Ditto*, Vol. 7, part 1). "Relations of Ants with Lice and Gall Insects" (*Brit. Biblioth. of Science & Arts*, Vol. 28). "Observations Upon Several Species of Bees" (Vol. 6 of the *Linnean Society of London*). An extract from this was published in volumes 25 and 26 of the *British Library* under the title: "Observations Upon Several Species of Bees Known Under the Name of Humble-Bees." "Letters Upon a New System of Meteorography" (*Biblio. Universelle*, 1828). "Letters Upon Aeronautic Spiders," (Posthumous article in *Biblio. Universelle*, 1866.

tions" on bees was published in Geneva in 1792. It contained a series of articles in the shape of letters to Mr. Bonnet, who had induced Huber to publish his notes. There was a reimpression published in Paris in 1796, in one volume in-12, to which was added a short, practical treatise on bees, anonymous.

A second edition was made in 1814, in two volumes. For the second, Huber, for want of Burnens, employed his wife, and later his son, as assistant.

Born in Geneva in 1777, Pierre Huber died at Yverdon in 1840.

This curious and beautiful work made the reputation of Huber and secured for him a membership in most of the academies of Europe, especially the Academy of Sciences of Paris. It also caused his being called at present the founder of modern bee-keeping.

(To be continued)

HONEY HINTS FOR SMALL PRODUCERS

By Josephine Morse

There are a good many beekeepers who keep only a few colonies of bees and do not plan to increase their apiaries, but who do like to produce extracted honey and strain and bottle it themselves, thus getting the retail price for their product. In such cases the returns will probably not be sufficient, nor will it seem expedient for the limited amount of honey obtained, to warrant much expenditure for equipment.

An easy way to strain honey is by the gravity method, which works very well with the use of the Cooley can, a tall cylindrical can with a cover and a very efficient gate at the bottom. This can was originally designed for raising cream on set milk. Honey is run right from the extractor into the can, then "set" for a day or two (or to suit one's convenience) to let all the small particles of comb, etc., rise to the top. Then, to get it perfectly clear, it should be strained through any desired small strainer made of the fine wire mesh used in milk strainers, either directly into the final containers or, if one is busy at something else, run into larger ones, from which it can be bottled later. Not until all the honey but about 2 pounds has run out of the can does anything clog the strainer. Straining will be more rapid if the honey is in a warm place. The cans hold nearly 40 pounds of honey.

If the honey producer puts his honey on the market he will want it to look attractive, and so should have a neat little label for each container. The public likes to see honey it buys; therefore, it may be advisable to use some form of glass jar—at least until his trade is well started. When customers are fully acquainted with the quality and standard of the honey they will take more kindly to tin cans, of which the 2-lb. friction top can is a convenient size, and can be sent by

parcel post or express with less danger than glass. A cheap grade of white paper, cut to completely encircle the can and come to within one-half inch of the top, is wrapped about the can and secured with a gummed honey label placed directly across the joining point of the two edges.

A well put up package has a distinctly favorable effect on the purchaser. Therefore, it behooves the producer, especially if he is his own middle man, to see that his product not only comes up to a high standard, but is cleanly and carefully prepared for market.

Massachusetts.

AT THE FOOT OF MOUNT HELICON

(From "A Journey Into Greece," 1682.)

By Geo. Wheeler, Esq.

"After I had discoursed some time with this good Old Man, whom they esteem a Saint, I was conducted below his Garden, between it and the River, to another Hutt; where two other Caloyers live, and look to a Garden well planted with Beans and Pease; and another just by it, furnished with four or five hundred Stocks of Bees. A Place near as pleasant as the other above; being just upon the Banks of the River; which I esteem to be that which Pausanias called Heraclitus; upon supposition that some of the forementioned ruins are those of Bulis. The good Caloyer presently went, and took a Stock of Bees, and brought me a Plate of delicate white Honey-combs, with Bread and Olives, and very good Wine: To which he set us down in his Hutt, and made us a Dinner, with far greater satisfaction, than the most princely Banquet in Europe could afford us. For the Quiet and Innocence of their Life, the natural Beauty of the Place, the Rocks, Mountains, Streams, Woods and curious Plants, joyn'd with the Harmonious Notes of Nightingales, and other Birds, in whole Quires, celebrating, as it were, welcoming that forward Spring, to speak the truth, so charmed my melancholick fancy for a time, that I had almost Made a Resolution never to part with so great a Happiness, for whatever the rest of the World could present me with. But in conclusion, it prov'd too hard a task for me, so soon to wean myself from the World.

LARGE HIVES FOR LOUISIANA

By Jes Dalton

We had a very peculiar streak of weather here lately. A continual rain one to four good showers a day and most terrific honey flow I ever saw, right in rainy weather.

Roads mostly impassable and swarming on a par with the honey flow, especially in 8-frame hives. I am working in a yard of 12 frame hives now and at present have not found a one that has swarmed or is trying to, and I am afraid over one-half my 8-framers will. I am of the

opinion I will never buy or make another part to an 8-frame hive.

First time I ever saw a honey flow in a rain. Last fall we had a spell of beautiful sunny weather and a heavy

bloom of honey plants and not one drop. It takes time to learn beekeeping in the South.
Louisiana.

HONEY SELLING

How M. V. Facey, in Building Up a Market for His Honey, Used a Corps of Small, But Effective, Mail Salesmen

By R. A. Franklin

Being an omnivorous reader, I frequently, out of pure curiosity, glance over the classified advertising columns in the various magazines on our reading table. In pursuance of this habit, I noticed in that section of the "Woman's World" this invitation:

"SEND for price list of our select quality clover, basswood and buckwheat honey. Sample 15c. M. V. Facey, Preston, Minn."

As at intervals, over a period of several years, I ran across this same adlet, my curiosity was aroused as to just what sort of results justified such long-continued use of it, therefore, when a convenient opportunity came, I called upon Mr. Facey.

After our introductions were over, I remarked: "You seem to believe that it pays to use the classified advertising columns of magazines; at least I should judge so from the number of years that I have seen your name therein."

"Well, that's the way I got all I have. Yes, I should say that they do pay—pay well" he replied, a friendly smile lighting his pleasant face.

And judging from the appearance of his beautifully appointed home, in the little hill-bound village of Preston, it must have paid very well, in-

deed, so I asked how such a program of advertising was managed advantageously.

"Well," he began, "to get results, one must use judgment in placing these or any other kind of advertisements. For instance, right now I am not advertising as heavily as usual, because of the money stringency and the slackness of business in general.

"Advertising in the agricultural journals, usually one of my very best mediums, I have discontinued for the next three or four months. You see, when the farmers began holding their wheat and other commodities for high prices, I knew money would not be plentiful among the majority of them this summer, and—right now—I'm selling more honey to miners than to farmers."

"About how much honey do you sell in a year?" I asked.

"Well, between four and five hundred thousand pounds, usually."

"You certainly do not supply that amount from your own bees, do you?" I exclaimed, in amazement.

With an amused, though kindly smile, he said, "No, indeed; not a pound of it. I buy from producers and distribute direct to the consumer."

"Living in a small town, how did

you ever happen to start in such a line of business in the first place?" was my next query.

"Oh, you see, I used to be a beekeeper. In fact, until about thirteen years ago that was my business in life. I began this sort of advertising to help dispose of the product of my own bees, and before very long I had more orders than I could fill. One dislikes to disappoint a would-be customer, so I took to buying honey to fill those orders. I had tried sending the money back, but people didn't like that very well either, so I bought more and more.

"And presently the business of buying and selling honey crowded out the beekeeping entirely; they don't mix very well. A beekeeper who cares properly for his bees hasn't time to administer a growing business. So I disposed of my bees and attended to my business."

"Do you get all your honey right around here, or must you go farther away to get enough to fill your orders?"

"About 150,000 pounds I get right here in the vicinity of Preston, and most of the rest of it within a radius of 150 miles. When I need to go beyond that radius, C. C. Clemons & Co., of Kansas City, and Hamilton-Menderson Co., of St. Paul, buy it for me in carload lots on a brokerage basis.

"Of course, most of my alfalfa honey comes from Colorado and much of my buckwheat honey comes from New York State, because there is where the best of its kind is made.

"I have even bought 80,000 pounds of honey in Cuba in time of extreme shortage in the home product, but Cuban honey is not very satisfactory to the trade—they don't care for its flavor. It's a nice clear, thick, white honey, too—but they don't like it.

"Clover and sweet clover seem to be the favorites, but the buckwheat and alfalfa come next, followed by basswood, locust, etc."

"In what part of the country do you sell the most of your honey?"

"Well, most of it goes to the East. Just now, Indiana, Virginia, West Virginia and Kentucky are taking the biggest amounts, though sizeable orders are coming from other parts of the East. Northern Minnesota, too, in and around Duluth, takes a large amount."

"About how many magazines do you use in your advertising campaign?"

"Usually I run ads in about thirty magazines, mostly ladies' papers and agricultural journals. I tried some in such magazines as the Cosmopolitan, but they didn't give very satisfactory results. The Farm Journal, The Modern Woodman and the Woman's World are three of my old standbys.

"Recently the Woman's World discontinued the classification of their advertising columns, and the results ceased to come as before, so now, instead, I'm advertising in Comfort, a magazine published in Augusta, Me.

"The Modern Woodman editor, too, got the idea that classified ads didn't pay, so wouldn't take anything but



The Facey home at Preston, Minn.

display copy. I didn't care to drop out of that magazine entirely, so I took a 21-line display ad. with them for a few months, but I didn't get one-tenth of the results I had from the 1-inch classified advertisement.

"So I wrote the editor, telling him my experience and discontinuing my use of their publication unless it should be decided to reinstate the classified advertising columns again; told him I'd rather pay double the old rate for the classified ad. He writes me that he's going to take the matter up with the Board of Directors, using my experience as an illustration of the greater value to the advertiser of the classified ad."

"How does the expense of this form of advertising mount up?"

"Take it the year through, I spend an average of between \$225 and \$275 a month for advertising. Right now, for the reasons I told you of, my advertising is only \$175 per month, but I shall begin advertising as usual in the farm papers again in August or September."

"Do you make any concessions to dealers in the matter of price or territory?"

"Well, to a certain extent, yes. I give no definite territory to any dealer, but I do make a difference of 3 or 4 cents a pound in the price to them, because they soon buy in large quantities and do more or less word-of-mouth advertising for my products. Of course, if an individual residing in his vicinity wants to buy direct from me, he can do so, and equally, of course, dealers are expected to be fair to one another in not encroaching one upon the territory usually served by the other."

By this method, with an annual advertising outlay of only \$3,000, Mr. Facey every year disposes of honey worth at a very moderate price estimate at least \$100,000. Of course, some years its value is considerably more; some years it may run a few thousand less.

HONEY AS SANITARY FOOD

By Paul Carton

Dr. Carton, a noted French physician, in his "Treatise of Naturalist Medicine, Alimentation and Hygiene," a work of 924 pages, Paris, 1920, has this to say concerning sugars versus honeys:

"Preserves, syrups, fruit comfits, candies, sweet entremets, desserts, sweetened drinks and dishes are products in which one consumes, without knowing it, important quantities of beet sugar and oftener of commercial glucose (the worst of chemical sugars). The lovers of these sweets and dainties had best give thought to the grave risks they are taking in consuming large doses of all these substances; it will be wise for them slowly to lessen the quantity consumed and to eat them irregularly and only, as an instance, to make up for the want of fruits.

"However, an exception should be made in favor of honey or grape preserves (the juice of grapes reduced by heating, mixed with cut up fruits.) The preserves made with honey are

sweet and do not have the tartness of industrial sugars. In small amounts they are better tolerated by diseased stomachs and by children than either sugar preserves or honey taken separately, because the addition of fruits attenuates or absorbs all traces of formic acid in honey. They are made by using a little more honey than fruit, in weight, and cooking the mixture a little longer than with sugar. They are less economical, but the increased expense will be compensated by a lessening of doctor and druggist bills.

"Honey. It is a diastatic and living concentrated sugar which, for healthy people, does not present the inconveniences of chemical sugars.

"Honey was known in the earliest antiquity. As early as the 6th Century, before our era, man sought to procure in great abundance this concentrated sweet, which supplied him with pleasant food at all seasons, and it was at that time that the first attempts at beekeeping were recorded. Later still, honey was much sought for; the Promised Land was the country of milk and honey. Honey was among the offerings made to the gods.

"Gathered by the bees in the corolla of blossoms, honey as we harvest it represents the product of floral nectaries, elaborated by the digestive secretions of the bee's honey sac and afterwards concentrated in the wax cells by evaporation obtained through the ventilation accomplished by this interesting insect.

"The final product contains 70 to 75 per cent of glucose and levulose; 0 to 10 per cent of saccharose, 1 to 1.50 per cent of dextrin and gums, 0.05 to 0.15 per cent of formic acid, about 0.80 per cent of nitrogenous substances, 0.10 to 0.80 per cent of mineral salts and 20 per cent of water. It also contains soluble ferments from the nectaries and from the digestive secretions of the bees,

which saccharify the starches and dextrine and change saccharose into glucose or levulose. These soluble ferments united with other ferments cause honey to become richer and richer in glucose as it grows in age.

"Honey, with its sugars still united with mineral salts, with acting diastase, with vital floral energies, is thus a living food and a physiological stimulant, the use of which should be much more expanded, for it is many times more dynamogenic and nourishing than chemical sugar. So, it should again be given the important place which it held in alimentation, before the discovery of chemical sugars. To sweeten moderately teas or entremets, cakes and culinary preparations, honey represents the best substitute for sugar.

"However, after showing the superiority of honey over sugar, it is important to mention that, although it is a valuable concentrated food for healthy people, it requires cautious use for sick people. For persons positively dyspeptic or arthritic, it does not prove itself the ideal, easily assimilated food, the 'cure all' that people believe it to be. Its laxative qualities are even unexistent in most cases. It would be a mistake to prescribe it to people of debilitated digestion and to praise it without discernment. There are restrictions which it is of universal interest not to conceal. For individuals with frail digestive organs, with whom all energetic concentrations are injurious, it may cause the following troubles: fermentation and burning at the stomach, lowering of appetite, heaviness, constipation, epigastric pains, congestive flushes of the face, itching and skin eruptions, insomnia, etc.

"Although it is an excellent food for normal people, honey is undoubtedly too strong for many sick people. The slightly ill, who cannot give up sweets, should prefer honey to sugar, taking it diluted or in preserves, or, better still, in gingerbread, prepared with real honey. In the latter case, the adjunct of rye flour renders it more readily assimilable and we have seen a number of dyspeptics who could not use honey in the natural state, digest it well in the shape of small doses of gingerbread (about an ounce) taken each day, during years when fruits are scarce, lacking in sugar or too acid.

"Let us add that honey eaten with bread is digested more easily than when taken alone, and that, for frail people, mild white honey, purchased directly from the beekeeper, in order to avoid possibility of adulteration, is much to be preferred.

"It is useful to learn that honey may be more or less successfully digested in different years, by the same patient. When the season has been rainy, with but little sunshine, and alimentary values are low, honey gives less irritation to the fatigued viscera. It may then be given in small doses to people who ill-digested it in hot seasons, especially as, at such times, its use is valuable to make up for the natural low value in sugar



M. V. Facey, the honey man with headquarters in a small town in Minnesota. He built up a big mail business of \$100,000 in selling honey.

of fruits and to furnish the material needed for muscular work.

"The variations in the composition of honey from one year to another have even been found in chemical analysis. In 1911, a very dry year, the proportion of glucose in honey rose to 72 to 74 per cent instead of the usual 65 to 68 per cent."

Paul Carton.

(The reader will note that the natural glucose in honey is entirely different in its properties from the artificially manufactured glucose produced by the action of sulphuric acid upon starch, which the above writer condemns in the beginning of his article.—Editor.)

CURING CHRONIC RHEUMATISM WITH THE STING OF BEES

By J. R. Schmidt

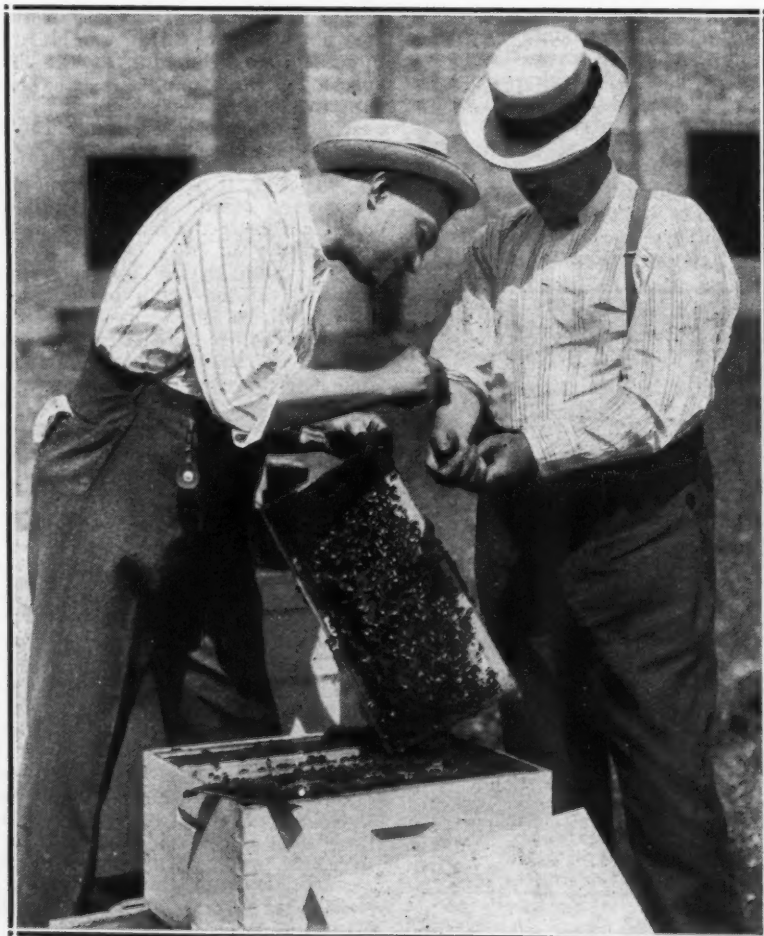
That rheumatism can be cured by the sting of the honeybee is the firm belief of George Renner, of Cincinnati, who is taking this novel treatment to eradicate the disease from his system. Each Wednesday and Sunday morning Mr. Renner visits the apiary of Fred Muth and submits to being stung by the honeybees. At first, when Mr. Renner could just hobble along with the aid of crutches, as high as ten stings were the strenuous treatment, but now Renner can walk without the aid of a cane, and only two stinging bees are applied twice a week. This novel treatment,

painful as it may seem, is a welcome relief for the incessant pain of the rheumatism.

"At first the sting of the bees was very painful to me and the swellings resulting from the stings were great, but as my system gradually became inoculated with the poison from the stings the pain and swelling grew less in proportion. I can now take the stings without flinching and feel very little pain at all. It certainly is curing me."

Fred Muth explains the strange cure this way: "It is a well-known fact that the sting of the honeybee is made painful by the formic acid which enters the wound when the bee stings. This acid is contained in a tiny little bag attached to the thick end of the stinger. When a honeybee stings, this little bag of acid and the surrounding muscles break away from the body of the bee and the bee flies away and dies, while the sting propelled by the adhering muscles, sticks into the flesh and keeps on imbedding itself deeper and deeper, at the same time pumping the formic acid into the wound. Physicians have found that formic acid counteracts rheumatism, and when introduced into the system, in many cases, causes a cure. Allowing one's self to be stung by the honeybees is introducing formic acid into the system, which in turn counteracts rheumatism."

Ohio.



Fred. Muth applying the stinging bees to Renner's arm.

THE CHINESE BEES

By B. Grudnoff

I made my first acquaintance with those bees in Peking, in the Russian Orthodox Mission, and also through other beekeepers in the Peking Province.

The exterior of those bees reminds me of our Caucasian bees, from Abasia (Asiatic Russia), but they are of a smaller size and brighter color.

The Chinese bees possess the same quality as the Caucasian—they are fond of work and of good disposition. They collect clear and transparent honey. The old wax they destroy nearly altogether, partly in winter time, replacing it with a new, white wax. They do not keep at all any dark honey-combs.

It is necessary to notice a particular quality of the Chinese bees: they never bring propolis (bee-glue), and do not use it in the beehive if it is given to them, and in all cases they use only wax, and even the holes in the beehive they glue with a pure white wax. At least, being one and a half years in China, I did not see any propolis anywhere. I supposed first that in China they did not have those kinds of plants from which propolis could be obtained, but those doubts were destroyed by one Chinese beekeeper who wrote for bees from the Far East (Siberia) to China. And those bees collected lots of propolis while the others, next to them, had not a particle of it. I think that those bees must be very interesting to American beekeepers, because they will always prepare clean sections without propolis, and it won't be necessary to lose time cleaning them, as is always necessary when getting honey from bees of other races.

If any one of the American beekeepers has any interest in these bees, it is possible to order them from the Russian Orthodox Mission in China, Peking (Bei-gooane).

Java.

STORING THE HONEY.

By L. H. Cobb

A good many beginners in beekeeping will have a fairly generous supply of surplus honey this year if conditions are general as they are with us. I know some of these who plan to keep most of their honey for home use, and they are planning how to store it, even now, and the plans of the amateur in this line are apt to be just opposite to what they should be.

Honey should never be stored in a cellar or kept in a refrigerator. Coolness is not what honey needs to keep it in good condition. It should be stored in a dry, warm place as free from dust as possible. Mice and ants are both destructive pests, and to be guarded against. It is not hard to guard against the mice, but to prevent ants getting to the combs is another question. One can hardly make the container, in which comb honey in the frame or section is stored, tight enough to stop ants, so the next best thing is to have it set up on a table fitted with ant protection. I have set the legs of the table in pans with a

little kerosene in them, and even after the kerosene is evaporated out of the pans it keeps the ants at bay. Most housewives have some favorite method of combating ants, so that, they will be able to make the honey safe in this line.

Honey will absorb moisture from the air if kept in a moist atmosphere. I have seen cappings turn dark and become almost transparent in extremely damp locations, so the wax cappings will not be a full protection, and extracted honey exposed to the air would soon begin to thin up if not in a dry, warm place. This thinning results in souring if carried far. There is nothing like thick, well-ripened honey, and we should let it get fully ripened before we take from the hives and then store in a way to keep it thick.

Extracting combs that have a considerable number of cells filled but not sealed will result in thinner honey and great care must be taken to keep this from fermenting. It is best to leave such frames on the hives until the flow is over entirely and then the bees will either empty the unsealed cells or fill them up, as the case may be. If they cannot fill when the flow stops entirely they will take out of part of the cells and store in others and seal what they have and leave the other cells empty. I have taken off frames where solid sealed honey filled a third of the frame and the remainder of a two-thirds built out comb was empty. Previously I had noted that the empty part of the comb had been full of uncapped honey, but the flow stopped suddenly and did not come on again.

An attic or an upstairs closet is often ideal for honey storing. If where the temperature will be kept comparatively even in winter, granulation will not be so bad as if subject to quick changes.

Kansas.

UNITING SWARMS AND COLONIES

By A. F. Bonney

The writer, early in his career as a beekeeper, had occasion many times to unite bees, as swarms were numerous, and many were secured, and after trying about every odoriferous substance known to the druggist, finally settled on peppermint, and has used it several years with uniform success, but without paying much attention to the why of his successes. Finally, however, curiosity took possession of his mind, and he began to study.

Next to peppermint, fair success may be secured with anise, using the oil dissolved in denatured alcohol, and this mixture in water, as the peppermint is used, but so much of it is required that it becomes quite expensive, and even then there are times when good results will not be secured. To mention other substances: cajeput failed in most cases, wintergreen gave poor results, oils of orange and lemon were failures, ammonia drove the bees out of the brood chamber in a mass, chloroform puts them to sleep and destroys memory, assafoetida acts

as smoke does but in a mild way, whole smoke and the odor of creosote and pyroligneous acid seem to have a tendency to make the bees ball the queen. Carbolic acid was a repellent pure and simple, as was naphthalene (moth balls).

While peppermint appears to temporarily destroy the sense of smell in bees, it differs from chloroform, which renders the bees dormant, as it does the human, and, as mentioned before, destroys memory in the bees. It is suggested that this agent will prove valuable in introducing queens.

Experimenting with peppermint, and its active principle, menthol, I found it ideal in every way, for the bees do not object to it, and will tolerate even the pure oil, dropped into the corners of the brood chamber, and a very small amount, so little as four drops, seems efficacious, and a very weak solution of the essence in water will enable one to unite swarms or colonies, no matter how excited or hostile they may be, and I finally decided that the odor of the peppermint had a paralyzing effect on the smelling organs of the little animals, and we know that the sense of smell is the principal one possessed by bees.

The factor of time is valuable when using the peppermint, and, as strange as it may seem, two colonies may be united within one minute after a moderately strong solution of peppermint in water is used, say a teaspoonful of the essence, which may be secured at drug stores, in 8 or 10 ounces of water. After uniting bees in this way I have found bunches of them saturated with the solution, and watching them carefully, found that they did not seem at all injured after they had dried off and gone to work.

I shall remark here, entirely for the benefit of the beginner, that if you have two or more colonies or swarms, with queens, to be united, pay no attention to the queens, for it is a provision of Mother Nature that when two queens fight for supremacy of the hive one will surely survive. If, however, one queen is to be saved, destroy the other.

Iowa.

POISONOUS SPRAY

By Will H. Gray

I have just read the letter by G. A. Barbisch about the poisoning of his bees by fruit spraying, and your own notes on the subject. In my experience the fruit grower sprays, not when it is best to spray, but when he can get the spraying machine, regardless of the state of the blossoms.

It ought to be easy enough to get a law passed making it compulsory for the fruit grower to notify the beekeepers in his vicinity of the day or days that he is going to use summer spray. The beekeeper then will have the alternative of shutting in his bees for that day or claiming damages in case of loss, as in the latter case proof would be simple. The effect on the "sprayer" of this law, would make him realize that there were other interests besides his own, and he would be more careful.

This fruit spray question is always cropping up in the irrigated lands of the West. It is generally thought that in a number of cases the bees get the spray in mistake for water, and not necessarily on the flowers; in this case water could be put out during spraying operations.

British Columbia.

EUROPEAN FOULBROOD

Something New (?) About It

By Arthur C. Miller

The subtle spread of this malady is baffling, as is also its rise in virulence and oft its disappearance.

It seems to come out of the thin air; to linger along, doing little or no harm, and then suddenly to develop a virulence which at one leap goes beyond control. But even that burns itself out by destroying every colony, and the very filth it leaves behind forces the owner to either destroy it all with fire or render the combs into wax, thoroughly cleanse hive and frames and make a fresh start.

Sometimes the re-established apiary remains clean for years, or the



A close-up of the stinging bees. Bee on the left is beginning to sting, while the one on the right is finishing, leaving the sting in the arm.

disease may reappear within a season or two.

Again, it will suddenly appear in some previously free yard far from any infected territory. How does it get there? I discovered one of the ways this summer. A thrifty apiary in territory never known to be infected before and two miles from the nearest known bees, had a stray swarm come to it and establish itself in a vacant hive containing a full set of clean combs. I chanced to discover it within ten days of its arrival, and fully half of the larvæ showed the disease. It was quite evident that a swarm can carry germs of the disease. Perhaps if they had had to build their own combs, they might have gotten rid of all germs before there was any brood to feed.

But any vagrant swarm from an infected hive may wander into our best kept apiaries and bring trouble galore. And if such a swarm joins a weak or queenless colony right in the midst of a lot of clean ones, we can easily see how quickly that apiary would be ruined.

And how can we prevent it? I don't know. But I do know it does not worry me the way it did. It is always a bother, but it need not be a calamity.

Rhode Island.

SOME HONEY PLANTS OF ALABAMA

By L. H. Pammel

There are great possibilities for beekeepers in the State of Alabama, and there are a large number of honey plants growing in that State. The writer recently spent a week in Alabama, and while there noted the bees, and the flowers they visited. My observations were mostly made at Montgomery and Tuskegee. In the vicinity of Montgomery, the chief supply of honey, while there, came from the biennial white sweet clover (*Melilotus alba*), although I am told that in western Alabama there is much of the annual white sweet clover, known as Hubam. There was some of the yellow (*Melilotus officinalis*). It took honeybees only a little over a second to drain each flower of nectar.

There was considerable of the small annual yellow sweet clover (*Melilotus indica*). The small yellow and the white biennial have fairly taken the country. Bees were abundant on the white and the biennial yellow, and occasionally they were observed on *M. indica*. I do not consider this of great value as a honey plant, judging from what I saw.

Another legume is spreading in the country, the black medick (*Medicago denticulata*). I did not see any bees on the plant, though they may occur. I was quite surprised to find that the white clover (*Trifolium repens*) was fairly common around Montgomery and frequently visited by honeybees. The limy soil of this region is well adapted to this splendid honey-producing plant. There are many native legumes, only a few, however, furnish nectar. There is an abundance of cultivated legumes like the lima bean (*Phaseolus lunatus*) and the cowpea (*Vigna sinensis*). While these two plants yield some honey, they are not important. Species of *Rhus* are abundant; of these the most common is the dwarf sumach (*Rhus copallina*), which is abundant in rocky woodlands or sandy pine barrens. This plant, like its near relative, the common sumach (*Rhus glabra*) and fragrant sumach (*Rhus aromatica*), should yield some honey.

The sumachs are common in gravelly soils. I was much interested to note the value of some members of the mint family. Horsemint (*Monarda punctata*) was common on clay and somewhat sandy soils, and is a good honey plant. I saw it frequently visited by bees, and they were from one to two seconds on a flower. Each whorl had from 3 to 5 flowers in bloom.

I might note the abundance of large horsemint (*Monarda fistulosa*) in woods. It is slightly different from our species. I did not observe any honeybees on this species. There are several species of *Pycnanthemum* in pine woods and the narrow-leaved Virginia thyme (*Pycnanthemum linifolium*), hyssop-leaved mountain mint (*Pycnanthemum hyssopifolia*), the whitish basil (*Pycnanthemum albescent*); in the Birmingham region the

American pennyroyal (*Hedeoma pulegioides*) was common. Catnip (*Nepeta cataria*) has become extensively naturalized, as well as the horehound (*Marrubium vulgare*) and motherwort (*Leonurus cardiaca*). Another good honey plant of this family is wood sage (*Teucrium canadense*), which is fairly common in places.

I was much interested in one of the cultivated shrubs, not infrequently planted as a hedge plant, thyme (*Thymus vulgaris*), which is one of the good honey plants. These plants were in full bloom early in June and were covered with bees from morning until night. The bees were, on an average, one and a half seconds on a flower.

The varnish tree (*Firmiana plantanifolia*), (the common name is a misnomer), is much visited by bees. It seems to be rich in honey. I saw many bees on it in Montgomery, and they seemed to find a great deal of nectar. On an average, they were from 4 to 6 seconds in a flower. The species is commonly planted for ornamental purposes.

At Tuskegee, I was much interested in watching honeybees work on the flowers of *Abelia*. I noticed that they got nectar, not in the usual way, but through perforations near the base of the flower. I thought at first that they were making the perforations, but soon found wasps were the real culprits and that the honeybees then made use of the perforations.

It seems to me that Alabama must be a paradise for beekeepers, with white sweet clover abundant in many parts of the State and, on the bottoms, such plants as sweet bay (*Magnolia glauca*) and magnolia (*Magnolia foetida*), though said not to be important; the tupelo genus (*Nyssa aquatica*), two species of basswood in the north, the common basswood (*Tilia americana*), which occurs only occasionally in northern Alabama, the silver leaf basswood (*Tilia heterophylla*), found in central Alabama, just in bloom. There are also several species of grape: the Muscadine grape (*Vitis rotundifolia*), the downy grape (*Vitis cinerea*) and the summer grape (*Vitis aestivalis*). I might say that members of the sunflower family are abundant, but nothing like our Spanish needle (*Bidens aurea*) of the North, the western bur marigold (*Bidens involucrata*). I noticed tickweed (*Coreopsis lanceolata*), but no bees on it. I noticed many asters and species of boneset, but none in bloom. The region is rich in members of the composite family and many of these furnish nectar. I noticed the Cherokee rose (*Rosa laevigata*) and the McCartney rose (*Rosa bracteata*) everywhere climbing over fences. These furnish an abundance of pollen. The list of honey and pollen plants might be greatly extended. There are, it seems to me, great possibilities in apiculture in Alabama; with the ever-increasing amount of sweet clover and the large number of honey-producing ornamental plants, Alabama should do wonders in beekeeping. I am told, however, that it is



Apiary of J. M. Cutts, 8 miles from Montgomery, Ala.

more profitable to raise queens and sell nuclei than to go into the business for honey production.

• The only apiary I visited was near Montgomery, and this man made a business of raising queens and selling the nuclei. The honey season is a long one, from February until November, with a long range of blooming honey plants. It seems to me this should be a great field for honey. It is a field, as I view it, that has scarcely been touched. I saw few apiaries in Montgomery and other counties. I dare say Alabama could easily double its production of honey. I am sure this is true for Montgomery county.

SIXTY YEARS AGO

To show how easily people may be led astray with theories, we here republish extracts of contributions to the American Bee Journal of 1861, the first year of its existence. Mr. E. Kirby, of Henrietta, N. Y., after reading the different articles expounding the Dzierzon theory on the fertilization of the queenbee, sustained a theory of his own, in 4 or 5 different issues. To quote Mr. Langstroth, who gave a resume of his views in a criticism, Mr. Kirby held that:

"The workers in their flight with the drones, alight on the drones' backs and cause them to give off their semen, which the workers lick up and carry to their appropriate cells in their hives, for the purpose of propagating the young queens. . . . The worker takes the semen thus obtained and impregnates the embryo worker larvæ in royal cells, which fecundates the ovary of the immature queen in order to give life to her drone progeny. She then comes forth fully prepared to lay eggs that produce drones only."

In a word, Mr. Kirby held that the royal jelly or pap which we now know is given similarly to all larvæ in the three first days of their life, and to the queen larvæ during their entire development, was the seminal fluid of the drone and that this was the explanation of the great number of drones produced in natural conditions. He said, also:

"I do not believe that the food or size of the cells have anything to do with the formation of their sexes. I believe that the queen, worker and drones are made such by impregnation at particular times; first, to form the queen; second, her ovary, to form the drones; third, the egg deposited from the drones in the queen's spermatheca, to form workers."

Again, farther along, he wrote:

"My theory is that, to produce the three sexes, there must be three distinct infusions of the semen. First, to impregnate the ovary to produce the drone; second, the queen infuses the egg from her spermatheca to produce workers; third, the workers infuse the worker larvæ in the royal cells and the ovary of the young queen, while yet in the cell, with the semen of the drone. Her eggs, when she leaves the cell, will produce only drones, without further fertilization.

In Huber's time, he believed the jelly, so-called, was of such fertilizing powers as to cause the ovaries of the worker to become prolific. Dzierzon also believed that the fertile worker's eggs had in some way been impregnated, to cause them to produce drones only. As it is proved by Dr. Donhoff that it is the animal secretion found in the queen's cell that effects the physical change from a worker to a queen, I do not doubt that this goes far to substantiate my theory. . . . Semen is retained in the combs from the time the drones are destroyed, at least until they appear the following season. . . ."

The very pretty arguments thus given were set to naught and the theory discarded, when the following very positive reply by C. W. T., of Hulmeville, Penna., was published in the December, 1861, number:

"Mr. Kirby has at last got himself and his theory in a tight place. He says: Semen is retained in the combs from the time the drones are destroyed, at least until they appear the following season. Here is a positive assertion that Mr. Kirby has got to prove, if he wishes to sustain his theory, for in no other way can he account for the production of queens in winter, or in the absence of drones; that is, according to his theory. If semen really exists in the beehive in winter, stored up in the combs, the microscope will show it, and I hope Mr. Kirby will occupy some of his spare moments, during the present winter, in procuring the necessary proof; for without it, his theory cannot stand.

"It seems to me that considerable confusion must exist in the minds of the advocates of the above theory in regard to the different functions of the organs of nutrition and of generation, or reproduction, and as to these functions being in any way interchangeable. Here we have it asserted that a substance, the semen of the drone, taken into the alimentary canal of the bees, and subjected to the action of the organs of digestion and assimilation, will produce a hybrid or cross in the blood! Is not this something new under the sun? I know that there are some agriculturists on a small scale, who believe in potatoes 'mixing in the hill.' This would be a case in point, taken from the vegetable kingdom, but the fact, like Mr. Kirby's theory, needs proof. We are also aware that there are thousands of white children born in the South every year who never know any other nurses than negro nurses, and I would as soon expect to account for the existence of mulatto children in this way, as I would for an impurity in the blood of the bee, by Mr. Kirby's theory."

WHAT IS A "COMMERCIAL" BEE-KEEPER?

By Geo. W. York

I have read the answer given to the above question by the Editor, on page 237. He seems to think I can answer the question as well as any

one, on the theory, possibly, that some people have, of "letting George do it," or "George can do it."

Sometimes I like to differ from other people (C. P. D., for instance) just to draw them out, and to stir them up a little. Mr. Dadant once said to me that he thought opposition was a good thing, as it causes the other side to bring out their best reasons for their opinions. So here goes on the "commercial" beekeeper question:

I would say that a "commercial" beekeeper is one that keeps bees, or produces honey, for the larger part of his living or business. I would hardly say that one who has only 50, or possibly 100 colonies, is a "commercial" beekeeper. I think his bee business should occupy the major portion of his time if he could claim to be counted in the class of "commercial" beekeepers.

I am just wondering if anyone running less than 200 colonies of bees could rightfully be called a "commercial" beekeeper. It might be that a queen breeder having less than that number of colonies would be entitled to a place in the "commercial" beekeeper class.

I don't suppose that this question is of very vital importance, and yet it was asked in good faith by a Washington beekeeper, and deserves a sincere reply, just as Mr. Dadant has already given it.

I noticed somewhere that the State of California claims to have 1,500 commercial beekeepers out of a total of 8,000. Now, are we to understand that these 1,500 follow beekeeping as a business? As California possibly has more commercial beekeepers to the square mile than any other State, I would like to hear from that locality, as well as from elsewhere, if ye editor deems the question of sufficient importance to devote a little more space to it.

Washington.

QUEENS, AND OTHER THINGS

By F. Dundas Todd

Having been gifted with a head for figures, I have great pleasure in facing a lot of statistics and arranging them in different ways to see what I can learn from them. Well, a lot of beehives provide just as much material for this kind of recreation as does any other line of human endeavor, so when I get my first lot of averages worked out, which concern the brood and honey consumption during the winter, I like to see how the various strains of queens have comported themselves, also how age tells on their egg-laying ability. So far, I have not got to the stage where I consider a queen is useless because she has attained the age of one, two or three years; I go by her record as exhibited in winter honey consumption, spring brood raising and honey production. When I dispose of a queen it is for a very definite cause. For example, number 20 at the end of April, 1919, was marked as being short of stores, but it gave a crop of 35 pounds in August. I then left 60

pounds in the hive to make sure it would have enough, but in the spring it had only 9 pounds left, with brood in only two combs. In fact it had consumed 18 pounds of honey above the average of the yard and had little to show for it. So that hive was marked with suspicion in my mind. In the first week of July, when the honey flow was due, it was not up to strength, having only five Jumbo frames of brood. So I killed the queen and combined the colony with number 19.

Weeding out in this fashion I find I have seven queens that were raised in 1917, thirteen in 1918, six in 1919, and nine of unknown age. Now for a comparison as to their merits:

Queens	Honey	Brood
1917	7 lbs.	5 1/4 fr.
1918	11 lbs.	5 fr.
1919	9 lbs.	4 3/4 fr.
Unknown	12 lbs.	4 1/2 f.

On an average, these 3-year-old queens did as well as any other lot in the yard, but I specially want to point out that it pays to be continually weeding out the poor stock. To show what an old queen, whose merit has been proved, can do, let me tell the story of number 9. She wintered and springed on 25 pounds of honey and had four fine Jumbo frames of brood in the last week of April. Two weeks later I divided the hive, moving the old queen with three frames of brood to a new stand. On June 25 the brood-chamber was packed with bees and I sold her to a man whom I knew had a good location, good even in a dry season. Two weeks later he reported that the colony had filled and sealed 20 shallow frames, that is close on 60 pounds of honey. All this from a queen raised in 1917, one that had to contend all spring with a very untoward season. I am always ready to kill a queen for cause, but not for age. I only wish my conditions were such that I could raise queens from my best stock, but for a man who sees his bees only once a week such is impossible, especially when weather conditions are erratic.

I did my best to raise some queens the past season, and got enough experience to make me sympathize with the queen breeders. At one time I had no less than eight nuclei with young queens waiting to be mated.

A famous astronomer once said in my hearing: "A fact is a wonderful thing," this being his sole contribution to an informal discussion that lasted for half an hour. Mr. Sladen, many years ago, stated this as a fact, that a young queen will not fly to mate unless the temperature be 65 degrees or above. My first nucleus was made on the 12th of May, and from that date to almost the end of June my notebook shows only two days—June 1 and 20—with a temperature of at least 65 degrees. Well, here is the result, only two of my young queens were mated. I need not expand my story by telling how I strove with these nuclei to keep them always provided with a young queen apiece, but I often thought of the remark made to me 40 years ago by an old friend: "It is easier to make five dollars than five cents," meaning that when times are prosperous business rushes to one, but when they are bad we have to chase much for little profit.

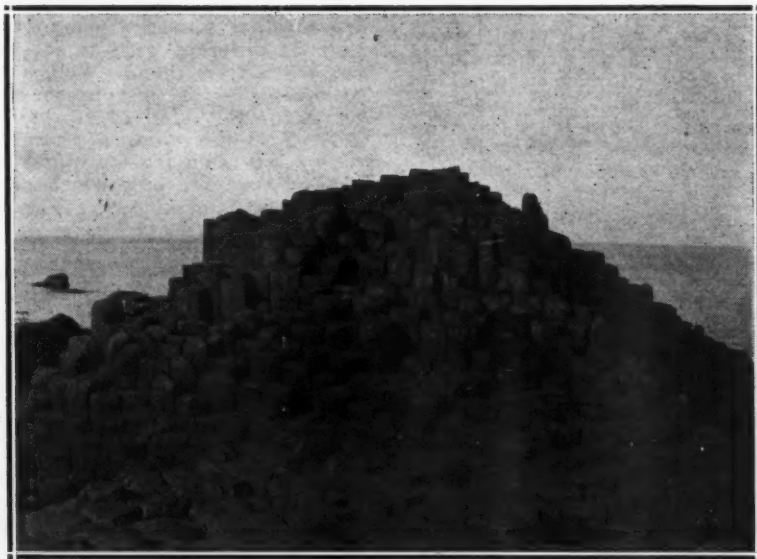
Concerning Fireweed

Another of Mr. Sladen's facts concerns fireweed, our greatest honey plant. A few years ago we were discussing it and I told him that while I was surrounded by thousands of acres of this plant, I had not seen a honey flow from it, yet in the books it was described as one of the most reliable honey-secreting plants. He then informed me that in dry weather the fine rootlets seemed to decay so that they could not absorb moisture, therefore, while the bloom was plentiful, there was no nectar in the flower. Since that conversation I have had more experience and think he is right. I have taken the trouble to follow the root system of fireweed and find it sends out horizontal roots a little more than an inch below the surface of the ground, and that these

are many feet in length. I remember one young plant that had roots four feet long. In my part of the world July and August are very dry, and June is not much better, but we generally have a few heavy rains in the third week of the month. For two seasons these June rains have failed, so our soil in July, our honey-flow month, has been very dry. Fireweed, therefore, has yielded nectar on low-lying swampy ground only, and here the crops have been very good. Much of my work among the beekeepers consists in pointing out to them the local sources of nectar and urging them to move their bees to more reliable regions, generally but a mile or two away. Only a few are in a position to move their half dozen colonies, these being merely a side line.

Regarding Advice

How few people will follow the advice they solicit! At the moment they are eagerly in earnest, but they are variable as the shade. It is not knowledge they are thirsting for, they have merely found an excellent opportunity for interesting conversation. No man with a colony of bees can make me believe he is keenly interested when he has not taken the trouble to read the bee bulletin that was sent him. But there is one man and his wife who cheer me up every year. They are, or were, alien enemies, but they were never such to me, merely hard-working, thrifty people making a comfortable living where many had quite a struggle for existence. I just love to get lunch in the kitchen, bread, butter, milk, lettuce, preserved fruit, all home products; the coffee is the only imported article on the table. House nicely furnished, children well clad and intelligent. What do they know about bees? Mighty little, but a dozen colonies provide them yearly with about \$200 cash, and all the honey they want for their own use. Yet but a short distance away is an old British bee expert who can go into the finest points of beekeeping, but he never gets a crop. It is a poor region, dry as a bone in summer; yet even there two men get good crops, probably from snowberry bush, but the expert has not had a moderate crop in seven years, yet one could throw a stone from one of the successful apiaries to his. What is the secret? I told these men as I tell many, leave one solid super of honey on each hive at the end of the season, above that an empty super half full of sacking or dry moss, leave the bees alone until the longest day, then put on a super or two. They obey absolutely, and get the honey, as their colonies are mighty strong when they do not swarm. Even swarming, as a rule, is all over in May, so the colonies are, in an average season, ready for the flow in July. On the other hand, the expert, who sneers at the other men's ignorance, will persist in keeping his bees according to the method he learned in the old land. He winters in an eight-frame hive, hence his bees are weak and short of stores in spring. He intends to feed sugar daily after pollen is available, but never does, so his bees are never



The Giants' Causeway, Ireland, showing large hexagonal blocks of stone.

ready for the honey flow. Thus he goes on year by year, with long explanations as to why he got no crop or a poor one, but of one thing he is certain, the fault is not his.

British Columbia.

THE HONEY COMB

By Will H. Gray

The beekeeper must often wonder where and how the bee developed the idea of comb. If one asks the average beeman where he has seen a similar formation he will, most likely, be unable to answer. If he has visited or seen pictures of those more or less rare occurrences such as the Giant's Causeway, in the north of Ireland, he will be at once struck by the resemblance to bee cells.

One does not have to travel to meet numerous cases in nature of the hexagonal cell, for we are surrounded by them on every side. We do not see them. Why? Because they are too small.

When the student sets up his microscope and examines a bee's eye he is at once struck by the fact, or coincidence, that it looks just like a piece of dark, regular comb. Later on he finds many other cases: the stem of a lily and the pith of the elder show six sided cells. Our interest being stimulated, we look at many other things. The outer coat of a holly berry is made up of four, five and six-sided figures, with many transition cells that at once remind us of those we see in brace combs, and between drone and worker cells.

There is a family of tiny water insects called rotifers; some of them incase themselves in a tube which is built up of little bricks made from their own waste food. These bricks are sometimes of hexagonal shape. If the little inmate is fed with food stained with different colored dyes, the protecting tube will have the appearance of layer cake.

I have, somewhere, a lump of chain coral that was dug up in Ontario. It is made up of small oval cells all joined together; quite an ideal home for little insects other than those who made it hundreds of millions of years ago; and, who knows? perhaps the ancestors of the honeybee at one time or another found a vegetable or mineral abode which suited their purpose during a stage of their wonderful development.

If we turn to the sea, whence the bee probably came, and look with the microscope at some of those beautiful little plants known as marine diatoms, we find one, at least, that looks familiar: this is the Honeycombed Triceratium, with its cells, though slightly elongated, as regular as an aluminum comb.

British Columbia.

(On this subject of the shape of the cells, Messrs. Langstroth and Charles Dadant had this to say (Hive & Honey Bee, paragraphs 212-213):

"An equilateral triangle would have been impossible for an insect with a round body to build. A circle seems to be the best shape for the development of the larvæ; but such a figure would have caused a needless sacri-

fice of space, materials and strength. The body of the immature insect, as it undergoes its changes, is charged with a superabundance of moisture, which passes off through the reticulated cover of its cell; may not a hexagon, therefore, while approaching so nearly to the shape of a circle as not to incommode the young bee, furnish in its six corners, the necessary vacancies for a more thorough ventilation?"

"Is it credible that these little insects can unite so many requisites in the construction of their cells?"

"The fact is that the hexagonal shape of the cells is naturally produced, and without any calculation, by the bee. She wants to build each cell round, but as every cell touches the next ones, and as she does not wish to leave any space between, each one of the cells flattens at the contact, as would soap bubbles if all of the same diameter. It is the same for the lozenges of the bottom. The bee, wanting the bottom of the cell concave inside, makes it, naturally, convex on the outside. As this convexity projects on the opposite side of the median line, the bee who builds the opposite cells begins, naturally, on the tip of the convexity, the walls of cells just begun, since she wants also to make their bottom concave. The final result is that one-third of the bottom of each of three cells makes the bottom of one cell op-

posite, and each one of the lozenges is flattened, so as not to encroach in the opposite cells."

Thus it is plain that, whether it is the bee's comb, or the bee's composite eye, or the stem of the lily, or the chain of coral, etc., those six-sided shapes are the result of rounded bodies, of similar diameter, pressing against each other and assuming the only shape that will make them fit together without any spaces or waste material between them.—Editor.)

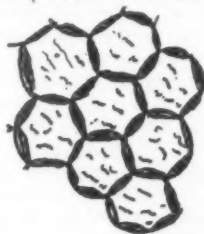
BEEKEEPING KNOWLEDGE

By Prof. H. F. Wilson

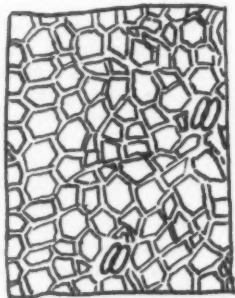
It is almost impossible to succeed with any business without a fair understanding of the basic principles of that business. No single movement has been more productive of better conditions among beekeepers than the extension work carried on over the entire United States during the past four years by both National and State officials.

Individual beekeepers have from time to time worked out new methods of manipulation, but the study of bee behavior has mostly been done by trained investigators who were able to properly interpret the results, because of a knowledge of such subjects as Physics, Chemistry, Zoology, etc.

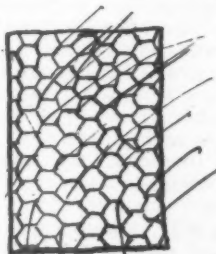
Progress depends upon knowledge. First the facts must be discovered and then they must, by means of books



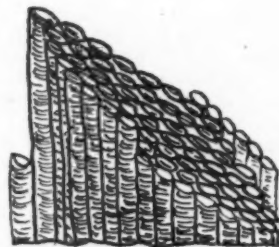
Cells from Stem of Lily



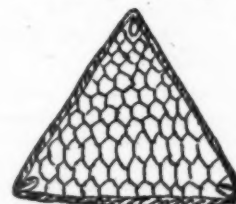
Outer coat of Holly-berry



Surface of Bee's eye



Chain Coral



Honeycombed Triceratium

Honey-comb similarities in Nature.

or magazines, be given to the general public.

No successful beekeeper ever learned how to keep bees in a single day, or even a season. Neither did he learn without many hours of study. His text books may have been the bee magazines and his laboratory the beeyard. Perhaps a neighbor beekeeper was his teacher. At best his education came slowly and oftentimes hard. Many a lesson was learned through some serious loss. By actual experience we learn what is best and sometimes what not to do.

Unconsciously the beekeeper becomes educated to a small degree in the sciences which form the fundamental basis of bee behavior and successful beekeeping. But without a separate study of these sciences many circumstances which happen in the work with bees and in the treatment of wax and honey cannot be clear to us.

It is not necessary that the beekeeper go to school to learn these things, for he may read and understand for himself. Also he may learn as much as is necessary by attending the meetings provided by our national and State extension workers.

Our extension men may sometimes be wrong in their teachings, but the good they do more than balances the bad. It is, therefore, urgent that every phase of the beekeeping industry, both State and National, receive the active support of each individual beekeeper.

It is also necessary that every large beekeeper, in so far as possible, familiarize himself with the fundamental sciences of beekeeping.

Animal Behavior

It is known that every kind of animal is directly influenced by the conditions which surround it. Food, light, heat, climate, and other things control the development. So the individual bee and the entire colony are influenced by these forces. Each individual bee lives for itself, but in its daily life it works for the colony and those things, which happen to influence one, influence all more or less alike when they receive the same stimulus.

The study of animal behavior in this case is a study of bee behavior. We learn that bees will behave in a certain way when certain conditions exist. For example, the bees cluster when the temperature falls, or, when the queen is removed or lost, queen cells will be started if young brood is present. Practically all of our manipulations of the colony then are based on bee behavior.

Physics

The relation of Physical Science to bees is clearly evident in the effect of heat, cold, light and other things on the behavior of bees. It is truly remarkable how bees respond to changes in temperature and in a lesser degree to light.

If the temperature goes below 60 degrees F. the bees form a cluster. If it goes above 70 degrees F. they engage freely in flight. Above 90 degrees F. brood rearing begins.

Bees fly more freely on sunshiny days than on cloudy days.

A light in the bee cellar draws the bees out and frequently many bees come out and are lost because of a single ray of light entering through the cellar wall. The property of honey to absorb moisture is also a physical problem.

Chemistry

The science of chemistry is very important, both in the food of bees and in its effect on honey. Unripened honey ferments and changes from sugar to alcohol and finally to vinegar. When honey is heated a chemical change occurs wherein the honey changes in flavor and color. The bee itself is a wonderful little chemical factor in that it produces wax for its combs, food for its young, a preservative for the honey and the fluid of the sting defense.

Climatology

Regardless of climate, bees remain the same wherever we find them, but climate influences beekeeping perhaps more than any other single science. It not only influences the life of the bee, but materially affects its food supply both as to quantity and quality. Bees depend upon nectar for their food; the nectar comes from plants, and plants are governed by climate both as to kind and amount of nectar secretion.

Weather conditions, from day to day, directly affect the manipulation of the beekeeper and govern his yearly program. In the North, weather conditions quite largely form the basis for the care of bees in fall, winter and spring, while in the South more depends upon the time and amount of the honey flows.

Geology

Perhaps unknown to himself, the beekeeper, soon after acquiring his bees, begins a study of geology, because the composition of the soil frequently determines the kind of plant and the amount and quality of nectar to be secured.

Topography

Mountain ranges, lakes, rivers, etc., or, as we call it, "the lay of the land," has a direct effect on climatology and helps to create beekeeping localities or regions.

Botany

This science deals with not only the kind of plants but their structure as well. The kind of plant and amount of nectar secretion is directly governed by climatology, but each species, or variety of plant secretes its individual flavor of nectar. The beekeeper is interested in botany, because he learns that different plants produce different kinds of honey and he must know the names of the plants in order to grade his honey. He also gains a more or less accurate knowledge of plants which do or do not secrete nectar and pollen.

To help increase our knowledge, the writer suggests that every practical beekeeper include in his bee library a popular text on each of these subjects, and during his leisure time read over those subjects which have some bearing on beekeeping.

Wisconsin.

SWEET CLOVER

By F. A. James

Sweet clover is a wonderful honey plant, especially when the weather has been dry during the blooming season, as has been the case this year.

Although we have had scarcely any rain during May and June, my bees have averaged 100 pounds or more of honey per colony. This I consider good under average treatment.

This, of course, is extracted honey. I began to extract on June 1, and wound up on July 4, and if weather conditions continue favorable, I expect to be able to take at least 25 pounds more from each colony, and still leave them ample supply to winter well on.

This clover continues over a long blooming period. This year it began to blossom about April 1, and now, on July 6, we still have considerable bloom for the bees to work on.

I would certainly most strongly recommend to beekeepers that they encourage this honey plant, but more especially the new white annual variety.

The biennial is equally as good a honey plant, but the advantage must rest with the annual over the biennial, in view of the fact that the annual will return a beekeeper profit from his labors in four months after seeding. The biennial is, of course, of no use to bees until it blossoms, which, as we all know, is the second year after seeding.

Alabama.

DRONE COMB

By E. M. Cole

The article on drone comb in the July Journal, by F. Greiner, was interesting to me, as I was on the lookout for the same thing. I had been too busy to get all my combs patched, so had a pretty good supply of drone comb in the supers.

Remembering Dr. Miller's remark, that one reason he used full sheets of foundation in sections was to prevent the bees building drone comb and holding it open for the queen, I kept close watch and found the bees held drone comb open and perfectly dry of honey until sometimes nearly all the balance of the comb was sealed.

I noticed another thing which surprised me: bees hold very dark worker comb open seemingly to as great an extent as they do drone comb.

We are taught that the queen prefers dark combs over light ones in which to deposit her eggs; but it seems from this that the bees have a say in the matter and by holding comb open or filling it with honey indicate to the queen where they want the brood. I noticed that newly-drawn combs usually had but a narrow half circle of brood when dark combs on each side of it were nearly solid with brood; probably new combs often come into use gradually as the bees get short of old comb and are forced to use the new.

Likely instinct guides the bees in their choice of old comb for brood as being less likely to melt down from

heat, and better protection from sudden changes in temperature. I was on the watch for another thing in the drone comb line: If the bees feel that there is a shortage of drone comb in the brood nest we are told that they will tear down worker comb and replace it with drone cells. I have often told that story while airing my knowledge to a beginner; but this summer I have acquired some doubt about it.

Some writer also claimed that this tearing out of worker comb was mostly, if not altogether at the cold end of the comb, that is, at the lower corner, next the entrance, while others claimed the bees tore out the lower corner without caring whether it was the cold or warm end of the hive. My 30 colonies are on 30 sets of combs that are hard to beat for all worker comb, and as I was using some foundation in the brood nest this would give the bees a chance to do some easy tearing on new and tender comb, and incidentally I could determine which lower corner they preferred to tear out and insert drone comb.

They didn't tear out any. Out of a hundred or more combs I examined I found just one where the bees had tucked a half dozen drone cells in each lower corner. They built drone cells next the bottom bar and alongside it and between the bottom bar and floor, but no tearing out worker and inserting drone comb.

I think this drone comb in the corners gets there in a perfectly natural manner. Foundation is sometimes given to the bees too late in the season to be fully drawn out, and they gnaw it badly, especially at the two lower corners, and when these corners are filled out later they are almost sure to be filled with drone comb, which accounts for many of the cases where bees are supposed to tear out worker comb and replace it with drone comb.

Bees evidently work over old cappings and use them again, tear down and use old queen cells, will tear to pieces and carry into the hive bits of old comb dropped on the alighting board, cut down deep honey cells to the proper depth for brood and use a large part of the material. They gnaw the edges of the combs, and especially the corners for material, and I believe the main reason they gnaw the corners of both combs and foundation is simply that the angle formed by the end bar and bottom bar gives them a much better chance to work. I believe most of this gnawing of old combs is done early in the season, when material for capping and repairing is scarce, the bees are mostly old, little or no honey coming in, and wax production at a low ebb.

I would expect the lower corner next the entrance to be gnawed the most, as it is longest out of use and more subject to damage by the weather, and when the brood nest is crowded down until it fills the hive these damaged corners are filled with drone comb, just as damaged combs are in any other part of the hive.

So I now have some doubt if bees ever deliberately tear down good worker comb for the express purpose of building in drone comb.

BEES BUILDING DRONE COMB ON FOUNDATION

By J. F. Diemer

Dear Mr. Dadant: You remember that we have often talked about why, and wondered how it happened, that bees sometimes build drone comb on one side, and worker comb on the other side.

Since you were here, I have been investigating a little in regard to how it happens so. I have concluded that the lesser wax moth, the kind that burrows under the young bees before they emerge from the combs, tangle the wings up so much that when they finally try to emerge from the cells they can't get out, because the web which is fastened to the wings and the base of the cells, holds them in. I have seen a patch of young bees as big as your hand struggling to get out; but they never succeed in breaking the web that holds them prisoners until the bees of the colony release them by gnawing away the comb clear down to the base of the cells. There is no way the bees can get hold of the little, quick rascals except by tearing all the cells off the base. The big fat common wax worm sometimes tunnels along just under the capping and over the heads of the brood; these are easily removed by the bees of the colony. But these wise little princes of darkness certainly believe in safety first, therefore they burrow under the brood, but only on one side of the midrib, never on both sides.

I presume that after the bees have gnawed away the cells right down to the midrib, and a honey flow starts, and they have no other chance to rear drones because full sheets have been used in each frame, and you know it is their nature to get a few drones some way; they arrange a flat place as large as the piece of comb I am sending you under separate cover. Now, Mr. Dadant, if you were a colony of bees (which you are not) and found a chance to rear some good big drones on one side of the comb, would you do it? The bees do, although I never caught them doing it. The next time I find a weak colony I will let them stay weak until they get a good nest of these little demons, then put the comb in a strong colony and keep tab on it.

Missouri.

MOVING BEES WITH ENTRANCE OPEN

By Jes Dalton

Having occasion to move some 150 colonies in midsummer, down in Louisiana, over swampy roads, I was naturally puzzled. In size they ran from 2-frame nuclei to 30 frame "long idea" fellows with two supers in them.

I, with an assistant, picked up one of the latter one night, boldly set it on a box in the rear of a Ford and set sail. Bees came out despite two active Jumbo smokers. Crawled all

over us, demoralized our guiding senses and speed control. I ran over a hog and killed it (cost \$10). All this about dusk.

Next day, after working in yard till a convenient time, I picked up a small load, packed them in securely, lashed them down with a 60-foot small rope, threw a canvass 10x29 feet over them, pulled to unloading location, uncovered them and next morning set them on stand.

After the "Canvass kink" I had no trouble at all. I hauled as many as 22 single story 8-frame colonies at one time. There are three kinks. Learn to lash, and there is a vast difference between lashing and winding rope around load. Lash so every hive will be tied, and then use a draw rope to take up slack in the lash rope. Tuck your canvass in good all around bottom of box, stuff it between fenders and box, and put burlap sacks in to hold it there, and be sure you ease Lizzie down into the chuck holes and over bumps, etc. And it is well to have a flap of the canvass loose so it can be opened and closed quickly. This last for "road hogs" that hold the entire road and make you slow down and go out into the ditch.

As you pull past them, loosen a few dozen well shaken bees and pull off and leave them together. Next day that rig will not only go into the ditch, but likely clear across it when they see you coming.

The bees crawl out and mix up some, but I went through and evened things up shortly afterward, and it was next to the only thing I could do in hot weather with hives full of brood, bees and nectar.

I combined moving with yard work. Would work in yard till time to load, and then load up and take a load to a new location to finish up day's work. I never smothered even a dozen bees that I could tell; broke no combs. I did not nail down lids. Some even had loose bottoms. I moved four miles. Some of the "long idea" queen-rearing and cell-building colonies had bars of cells in them in all stages, and these were not even molested, and all later hatched out O. K. Louisiana.

ALDRICH AS A HOST

I returned from Smithland last night, where I attended one of the most largely-attended and successful meetings of the year. There were fully 100 persons in attendance, beekeepers and their wives. The weather was ideal and the interest great.

We met on the B. A. Aldrich farm, and he was sure a fine host.

I asked those present to put down the price they expected to get for honey in small quantities at retail, 5 and 10-pound pails. An analysis of these figures showed the sentiment to be a shade better than 20 cents a pound.

There is a great sentiment in Woodbury County to peddle honey from house to house, and no doubt much will be disposed of in this way.

As smartweed is just blooming, I am almost certain to have a fall flow.

A. F. Bonney.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

Willow Herb

I notice in the A B C of Bee Culture an article about a plant called willow herb as being a large producer of nectar. Would be very thankful if you or some of your correspondents would give me some information about it; also where it can be obtained. Am starting with bees and wish to get all the information I can. We have just started an irrigation system here and hope to soon have plenty of alfalfa growing around us. The farmers here seem to prefer that for their hay crop, but if there are other plants that will bloom at different times, am eager to learn what they are, so as to make the season of honey flow longer. Will say I am very much interested in the Journal and read it from start to finish as soon as it arrives.

OREGON.

Answer.—Willow herb or fireweed (*Epi-lobium angustifolium*) is just a weed growing in the burnt-over regions of Michigan and Wisconsin as well as in Canada. It is said to grow some in the northern States of the Pacific Coast. It yields delicious honey, but it has never been grown artificially, and we doubt whether it would pay to try to grow it, as it seems to succeed only where the land has been cleared by fire. It cannot be considered in the same class with alfalfa. The latter is a very useful fodder plant. To buy the seed of willow herb, try some of the large seed houses in any of the large cities. There is certainly very little demand for it.

Moving Location of Bees in a House-Apiary

I have 9 hives of bees in a house-apiary; they are placed on a stand along one side of the house. This stand is becoming weak, so I built a strong one on the other side of the house. Now I would like to move my bees to this side. Will you please advise me how best to do this without losing the field bees, and when is the best time of the season to do it?

NEW HAMPSHIRE.

Answer.—This is probably one of the most difficult problems in beekeeping. You can move bees easily, but to move them a short distance, especially from one side of a house to the other, is difficult to do without losing bees.

If you think you can afford to do it, move them after smoking them heavily, early some morning; then if many bees return to the old spot, move them back in the evening. When you move them for the third time, the following morning, or that same evening, they will feel like looking around before leaving, and you will lose but few. Placing a slanting board in front of the hives, after moving them, helps to make them look back as they issue from the door. The important thing is to let them realize plainly that something is wrong. The better they realize it, the less of them will make the mistake of returning to the old spot.

Cuban Honey for Feeding

Buy up some of the fine white honey here in Cuba that was not handled properly by the Cubans and others because extracted too green, and ship it to the States, locate near some live town or city and feed this honey to the bees to produce comb honey for peddling. What price could we pay for this kind of extracted honey when we sold the comb honey for 15 cents per pound? In other words, how much extracted honey does it take to produce a pound of comb honey? My experience here was that it takes 7 lbs. or better of honey to produce 2 pounds of comb honey; but I do not think that my conditions were ideal for

this work. Will amber honey be lighter in color after the bees work it over again? I thought it was some lighter than honey not worked over.

CUBA.

Answer.—This proposition is hardly practicable. First, the unripe honey thus bought may be fermented in such a way as to make the honey unpalatable, after it is worked over by the bees. The chance is also that there might be honey of different grades and different colors in the lot. But more than all is the probability of loss in feeding it to the bees. Of all the enterprises of this kind that I ever saw, none succeeded, because of the great trouble of feeding it back. Ideal conditions are rarely found, and the probable happening would be that the bees would consume so much of it in comb building and in breeding that it would be unprofitable. All the experiments ever made indicate this to be the result.

If there is any change of color in the manipulation of this honey by the bees, I am inclined to think it would make it darker rather than lighter, though I don't know this positively; but just the thickening of it to ripen it would tend to give it more body, and therefore deeper color. If anyone has tried anything of this kind on a large scale and succeeded, we would like to hear from him.

Water for Bees, Etc.

1. During a recent hot spell I placed a small can of water by the entrance to one of my two hives, and a force of bees took water into the hive nearly all day. Can bees be given too much water?

2. When giving a new or weak colony of bees a frame of brood from a stronger hive, shall I brush all the bees off it into this strong hive before placing the brood frame into the new colony?

3. A recent morning I discovered bees had taken out of hive two larvae and two young bee skeletons; they seemed to be healthy brood, and have apparently healthy also. Why were larvae taken out of hive?

CALIFORNIA.

Answers.—1. No; bees will take only what they need of water in nursing the brood. It is not known to be used for any other purpose than to dilute the honey for brood food.

2. If the honey crop is on, you may give the comb of brood with all the young bees on it, making sure that you are not also giving the queen. If there is no crop on, at the time, it is better to brush all the bees off or shake them off. Usually, when you shake them off very few bees are left except very young bees, and those are most likely to be accepted.

3. I don't know. I suggest that there may have been a moth web passing by the cells containing those grubs or immature bees, and that the bees had to remove them in order to repair the damage. This is only a guess.

Royal Jelly

Please explain how artificial royal jelly is made when none is to be had and a person wants to rear queens artificially.

NEW YORK.

Answer.—While several parties have recommended different things to take the place of royal jelly, we would not recommend anything that the bees did not make themselves.

Royal jelly was long thought to be quite different from the pap fed to the worker larvae. But it is becoming more and more evident that

there is but little difference, if any, except in quantity, between the pap given to the queen larvae during the entire time of their growth and that given to the larvae of workers during the first three days of their life as grubs. That is why we find, as Schirach informed us, as early as 1771, or 150 years ago, that the bees may rear queens from any larvae not over 3 days old. Huber confirmed this and insisted on the fact that the bees generally select larvae 3 days old to rear queens. After that age they are fed on coarser food.

I see no reason why you may not use the pap found in any cell containing a young grub, as royal jelly. There are always plenty of young larvae in hives that are breeding, at the time when queen rearing may be carried on. True, it is not so plentiful in those cells as in real queen-cells, for the bees always feed the young queens plentifully, and that seems to be essential to their growth and perfection.

Concerning some of the experiments made and the conclusions drawn therefrom, in regard to royal jelly, read paragraph 491 of the "Hive & Honey Bee, Revised."

If, however, you prefer to have real royal jelly, you may follow the Pellett plan, Demaree fashion. Leave the queen of the colony on the comb where she was found, in an empty hive with foundation, on the old stand. Above that put a queen excluder, then an extracting super of combs, and above this the original hive containing the brood. "Twenty-four hours later the bees are given a frame of cell cups containing larvae. These cups are placed in the hive in the same manner as usual, except that they have no royal jelly. A thin syrup made with sugar and water is then poured freely over the tops of these frames. The worker bees gorge themselves with this syrup and since the brood in the upper chamber is so far from the queen below, the bees are easily stimulated to start queen cells. Usually from one to three of these dry cells will be accepted, and two days later will furnish an abundant supply of royal jelly for grafting purposes."

Doolittle appears to have been of our opinion when he discussed the matter of royal jelly. He wrote:

"I claim that the food fed to all larvae, up to the time they are 36 hours old, is exactly the same, whether the larvae are designed for drones, queens or workers."

The important thing is to have the bees supplied plentifully with honey and pollen at the time when they are rearing queen-cells, for they certainly cannot supply royal jelly or pap, as plentifully as is should be furnished, unless they are in thriving circumstances.

Pails for Honey

Do new tin pails have to be washed before filling with honey?

I have always washed them with hot soap water, then scalded them and drained and set them out in the hot sun to dry; but always find a little rust starts in drying, and when I get 50 pails or more washed the water is nearly as clean as when I started.

Why not dust them and be done with it? Is there any harmful chemical used in the manufacturing of these pails which has to be washed out?

MICHIGAN.

Answer.—Certainly, it is sufficient to either wipe or dust the inside of the pails to make them fit to contain honey. There is, however, a recommendation to make: Do not use pails coated with lead-tin. Lead-tin is of duller color than real tin, and is rarely used, but we have been warned by chemists that the lead in such tin might decompose and become poisonous.

It is a peculiar, but significant fact that honey does not rust tin pails a sugar syrup

does. We have had honey in the same pails for as many as five years, and the tin was as bright as new. However, there would be rust in the joints of the tin, where the iron under it was exposed, if it was not fully soldered.

We had your experience exactly when we tried to wash pails either before or after using them for honey. They rust readily then. The tin which is made nowadays does not compare in quality with that of 50 years ago.

Extractors—Removing Pollen

1. Is the 26 M. D. P extractor suitable for extracting from full depth Modified Dadant size aluminum honey combs?

2. Would this extractor throw out all pollen from cells?

3. When the Deadman wet comb cleaner is employed, if pollen were present in cells, would pollen be cleaned out and stored in hive of "cleaned-up" colony?

4. Would pollen intermixed with honey react chemically with it, or tend to produce a change in its composition as catalyzers sometimes do.

MINNESOTA.

Answers.—1. Yes, that extractor is of the proper size for all frames $13\frac{1}{2}$ inches in depth, or less, and of standard length. As to extracting from aluminum combs, there should be no difference in conditions between those and the wax combs.

2. No extractor, as far as I know, ever threw pollen out of combs.

3. Pollen is never carried out by the bees, as honey is.

4. I have never known of pollen causing any chemical reaction in honey, though it might, perhaps, if it was in great amount diluted in the honey. We have never had any trouble with it, except when bees fed on honey containing many grains of it, are confined to the hive for several weeks in winter. Then the pollen consumed evidently loads their intestines and causes diarrhea.

Transferring in Virginia

What is the latest date, in Virginia, that one can drive bees into a new hive and they will make honey enough to live through the winter?

VIRGINIA.

Answer.—The latest date, at which bees can make enough honey to winter, depends upon the blossoms of the locality. If you have asters, goldenrod, boneset, etc., in your vicinity, the bees may make enough to winter after the first of August. But if you live in a location where the tulip tree and white clover are the only sources of honey, your bees will make but little honey after the 15th of July.

The proper time to transfer bees from box hives or gums into movable-frame hives is the spring, just about the time of fruit bloom. At that time there is the least honey in the combs, and yet the crop is only a few days away.

Vinegar From Honey

I have about 50 5-pound pails of last year's honey on hand, and I find that some of it is beginning to ferment.

Can I make it into vinegar, and if so, how shall I go about it to do it?

I did not extract until real late in the fall, and thought it would be all right, although a few combs were not well filled and capped, and some others only partly capped. IOWA.

Answer.—Yes, you can readily make vinegar out of that honey. It takes from $1\frac{1}{2}$ to 2 pounds of honey for each gallon of water. We find that it is better that it should be heated, to kill the very diverse germs in the honey. Then mix with the liquid a small portion of fruit juice, after the honey is sufficiently cooled. An alcoholic fermentation will begin which will soon change into acetic, especially if you mix some vinegar or vinegar mother

with the liquid after the first boiling. The more air it gets, the quicker the acetic fermentation will come.

If you do not care to make so much vinegar, you may be able to save a part of that honey. That which is at the bottom of the pails is bound to be thicker and better. So you may use only the thin honey for vinegar, then melt the other slowly over hot water, which will help evaporate any ferment that may exist in it. Do not heat it over 160 degrees. You will find it much thicker than before, after it cools down, for some of the moisture it contains will evaporate during the heating.

You may make vinegar out of a liquid containing only 1 pound of honey to the gallon, but we have never thought it was strong enough.

Dead Brood—Miscellaneous Questions

1. Is there ever any dead brood in a healthy colony not affected with foulbrood?

2. When is the best time to requeen or Italianize?

What plan would you recommend for transferring a colony from an old box hive, and what time of year?

4. When there is some dead brood that is about ready to emerge, is there danger of disease of any kind?

5. Is there any kind of disease that affects the brood when it is almost ready to emerge?

MISSOURI.

Answers.—1. Yes, there may be tarved brood or chilled brood. In either case, it usually dies in large patches, all at one time, while the brood which has died from foulbrood dies in irregular spots, one here and one there, till all are dead, but at different stages of growth.

2. Requeen or Italianize at any time during the summer. It is better to do it during the honey crop, because at that time the bees accept a new queen more willingly.

3. It would take several pages to give explicit instructions on transferring bees. It had best be done in spring at the time of full bloom of fruit. But it may be done at any time if you do not care to save the combs.

4 and 5. American foulbrood attacks brood after it is sealed in the cell, but not when it is "just ready to emerge." Get a text book and learn to recognize the difference between the different brood diseases.

Getting Bees From Trees

The writer has just come into possession of a piece of country property which has six colonies of yellow bees (the oldest 3 years old) in large oak shade trees, which to cut down would hurt the appearance of the grove. Scaffolds can be built so as to cut into hollow of tree and get the honey. I would like very much to drive the bees into hives and try to save them. Will you please refer this letter to the right department with request that I be advised as to best way to get bees into hive and whether or not July 15 will be too late for them to be transferred?

ALABAMA.

Answer.—It is difficult to advise correctly, as we are not acquainted with the position of the bees, height of tree at the hole, etc. Assuming, however, that the bees are within reach with an ordinary scaffold or table, I would advise that you cut a hole above the swarm. The hole through which they enter is usually at the base, but if the swarm should be below the entrance, then cut the hole at the lowest point, where the swarm is, so as to have one hole above and one below.

Then, with a bee smoker, drive the bees out by forcing smoke at the lower hole. If you do it right, by not giving too much smoke at first, and if you place a hive above the upper hole, the bees will crawl out in mass and

will readily cluster in the hive in question, provided the smoke does not also enter it.

After driving the bees, open the cavity, remove the combs and fasten into frames, for the use of the bees, all the worker brood and as much of the honey as may be handled unbroken. With this method, if the weather is not too hot for handling the combs, you may transfer the bees into good hives, with enough honey to winter them. We cannot advise you as to the best time to do it, as we are not acquainted with the best honey season of your locality.

Requeening

I have been attempting for two years to requeen some colonies of hybrid bees which I have with Golden Italians, but they are very defiant and obstinate in the matter and kill the new queen each time.

I have your book, "One Thousand Questions and Answers," and have followed all the different methods very closely and carefully, but cannot have them accepted successfully. I have twenty colonies which I wish to requeen in an outyard, and have a few fine golden ones in my back yard in the city, from which I expect to raise the queens to requeen the outyard.

After raising the queens and having them mated in the nucleus hive, could I shake the adhering bees from the brood frames in hives in the outyard and then add these frames to the nucleus? Of course, I would close the entrance to a small opening for some time. I would place the hybrid bees on empty comb in same hive as before and place on the old stand. In three weeks I could repeat this operation and place these frames in another hive body and place this body over the nucleus, and in this way could have a populous colony for winter. I have plenty of frames of honey to add for winter feeding in case of no fall flow. I run the hybrids for extracted honey this year and have about 150 full-depth frames full. I also have a good cellar in which to winter them. If I wished, I could let the hybrids die this winter if I succeeded in this plan. What do you think of this plan?

Could I do the following, if I do not succeed in raising enough queens of my own, purchase new queens and release them from their cage on a full frame of hatching brood from the hybrids, with all adhering bees brushed off, and place this frame in a hive-body over a colony with a screen between them so they will be kept warm for a week or so and then remove to a stand of its own and then proceed as above?

OHIO.

Answer.—If I understand you correctly, what you propose to do, instead of introducing queens, is to strengthen the nucleus in which such queen is reared until it makes a good colony. That is all right and very practical.

The releasing of queens on frames of hatching brood is also very practical. The method of introduction used by most people by caging the new queen after killing the old one and keeping the new queen between two frames of brood for 2 days is quite simple. But since you do not appear to succeed with it, the methods you suggest will both do.

Keeping Comb Honey

Is it necessary to treat comb honey, if kept in a room where there are no flies or millers, and if nothing shows up in the way of moths after it has been off the hives for two or three weeks?

What about using the method of G. H. Cale, explained in the July number of the American Bee Journal? Would carbon bisulphide be all right to use in that case? Is there any danger of it coloring the honey combs as there is from the smoke of sulphur settling on them?

I haven't a large stock of comb honey, but am selling some to private customers which they will keep for many months, and don't want moths to hatch out in it after it leaves my hands.

SOUTH DAKOTA.

Answer.—It is always best to fumigate comb honey after it is removed from the hive, although if it is taken from a strong colony and placed away from exposure to moths without delay, there may be but very little danger

of moth larvæ hatching in it. Usually the eggs which are laid by the moths are about the edge of the sections, and if these are scraped at once it may remove the eggs that may have been laid on their edges.

Mr. Cale's advice is good. Bi-sulphide is easier to use than sulphur. There is very little danger of coloring the combs, even with sulphur smoke, for it is not the smoke which is expected to kill the moths, but the gas formed from combustion.

A very small number of moth larvæ will damage the sale of comb honey, so it pays well to be careful about it.

Bees and Grapes Again

A friend of mine said, the other day, that he wished I would move all my bees out in the country, for when his grapes got ripe the bees would sting the grapes and then turn around and suck out the juice. He also said that last year he bet he poisoned 10,000 bees with poisoned water around his few grape vines, from his kitchen door to the coal shed on the alley.

I told him I thought the birds were the first ones to pick the grapes, leaving an opening in the skin so the bees would work on them.

It has been tried in the courts in California, but I do not remember what the result was. I hope there is a law some day fining people for poisoning bees in fruit bloom or any other time. I hope there is a honey flow when the grapes get ripe, so they will not bother them. My bees have done fine this year, so far.

KANSAS.

Answer.—That friend of yours would probably deny having said that he managed to poison 10,000 of your bees intentionally, if he should be called before a court, for when a man is mean enough to do that, he is mean enough to lie about it. There is no doubt that he could be held liable in a court if the intentional poisoning could be proven.

However, this man is also as ignorant as he is mean, for he undoubtedly believed that the bees do puncture fruit. He is like the fellow who denies that the earth turns around the sun or revolves upon itself, because he does not see it move. He takes things for granted which are false. There is one very simple way to convince him, if he is open to conviction. Take a bunch of ripe grapes, puncture two of them, while making sure that there are no other damaged grapes in the bunch; then place them, before his eyes, in a hive of bees, right upon the combs, and leave them there 48 hours. After that time, he will see that the bees have only sucked the juice of the berries that were punctured before they were put in. This ought to convince any sensible man that bees cannot damage sound grapes.

As to the bees stinging the grapes, if they would do it, they would insert poison in them and that would make them unfit for either bees or men.

We had to investigate this matter thoroughly for ourselves, for we had a number of irascible neighbors who took it for granted that we were getting rich out of their grapes, by our bees puncturing them and helping themselves to the sweet juice. On the contrary, we were losing bees, and the juice which they were storing in lieu of honey made them sick in the winter. So we have as much reason to keep the bees out of the grapes as the other man has. This was in 1879. But our neighbors were so fully convinced that we were right and that our bees could not injure sound grapes that we have never had any trouble since.

Some men will tell you that the bees always make two holes in the berry, one just above the other. Those holes are made by the beak

of the bird, when eating. Of course some grapes also crack open, in moist weather, and others are punctured by hornets, which have saw-like teeth, entirely unlike the smooth jaws of honeybees. That the bees cannot injure sound fruit is a proven fact, but there are people who would very much dislike to see it proved, for they delight in holding some one responsible for their bad luck.

ODDS AND ENDS

Indiana News

The July letter of the Secretary of the Indiana Beekeepers' Association is at hand. It breathes activity and accomplishment. With only three inspectors at work, 1,262 apiaries, totaling 10,491 colonies, were inspected from May 25 to July 4.

Both American and European foul-brood are being overcome, according to Mr. Yost. With larger funds available for 1922, it is hoped to carry the inspection campaign near a successful termination.

Organized county associations are helping the good work.

Bees Trained to Answer Signal

London, July 6.—The sound of a gong is the signal for a large swarm of bees to begin and end their daily labors at Fleet, Hants, says the Daily Mail.

Trained by Mr. Alder, the bees wait for the order to start work at 6 a. m., and at the sound of the monotonous bangs on a metal dish the swarm starts from the hives.

Working all day among the lime trees which surround the estate, the bees cease their labors when the time gong sounds, like so many human beings. An hour afterwards the bees are sent to bed by a soft note from the gong.

The above is from a Toronto paper.

I think the owner of these bees might hang a pencil on a string to each hive and have the workers mark up the quantity of honey brought in on each trip. One of the drones could then figure up the grand total at the end of the day. This would give the

queens something to gossip about as they strolled up and down in front of the hives in the cool of the evening.

Fred Osler.

Changes at Ames

The beekeeping work at the Iowa Agricultural College has recently been rearranged so that Prof. F. B. Paddock will in future spend all his time with teaching and investigational work. The extension work in connection with the position of State Apiarist has been so heavy that it could well occupy the entire time of the person responsible for it. We have not as yet seen any announcement as to who has been selected for the position of State Apiarist. Our Iowa readers will be glad to note that Professor Paddock is to remain at Ames and that his entire time will be spent in the service of the beekeepers, although the work is to be divided to give him more time to devote to teaching.

Value of Bees in U. S. A.

Completed census reports give the total value of bees in the United States at \$16,855,251, as compared to \$10,373,615 in 1910. California and Texas lead the list, with over a million dollar valuation for each, with New York, Pennsylvania, Illinois, Tennessee, Iowa and Missouri following in the order named.

Lower Freight Rate

A recent news item conveys the information that the freight rate on honey from Pacific Coast points to the Atlantic seaboard has recently been lowered 10 cents per 100 lbs. in car lots.

Millen in England

F. Eric Millen, Provincial Apiarist of Ontario, with headquarters at the Agricultural College at Guelph, is enjoying a two-months' vacation in England, his native land. He expects to return early in September to continue his school work at the College.

BEES ON FARMS IN THE UNITED STATES AND PRODUCTION OF HONEY AND BEESWAX

Preliminary report of the number of bees in the United States and production of honey and wax, for both 1910 and 1919 are now available. We believe they are sufficiently interesting to our readers to be reproduced here.

Unfortunately, no bees and no honey production was reported for cities. This would make quite a difference in the totals as reported; just how much, it is difficult to say.

Bees on Farms

The number of hives of bees on farms in the United States on January 1, 1920, according to the Fourteenth Census, was 3,476,346, as compared with 3,445,006 in 1910, showing an increase of 31,340, or 0.9 per cent. In making comparisons between these two years the change in the date of enumeration from April 15 in 1910, to January 1 in 1920, should be taken into consideration. Especially in States where the winters are severe, the number of hives of bees on farms in April of any year is likely to be considerably less than the number in January. In such States the 1920 figures may be somewhat too high for a fair comparison with 1910. It is probable, therefore, that a count of the hives of bees in April, 1920, would have shown a decrease, as compared with the number in 1910, rather than even a slight increase.

The States reporting the largest number of hives of bees on farms on January 1, 1920, were Texas, with 235,111; Tennessee, with 191,898; California, with 180,719; North Carolina, with 163,956; Illinois, with 162,630; Missouri, with 157,678; Kentucky, with 156,889, and Alabama, with 153,766. These eight States are the only ones which reported over 150,000 hives of

bees in 1920. Tennessee showed the greatest absolute increase, with 47,417 more hives of bees in 1920 than in 1910, and Oklahoma was second, with 27,330 more hives in 1920 than in 1910.

Honey and Wax

The production of honey in 1919 was 55,261,552 pounds, as against 54,814,890 pounds in 1909, an increase of 0.8 per cent. The production of honey is fairly uniformly distributed throughout the United States. Six States reported more than 2,000,000 pounds of honey produced in 1919, as follows: California, 5,501,738 pounds; Texas, 5,026,095 pounds; New York, 3,223,323 pounds; Iowa, 2,840,025 pounds; Wisconsin, 2,676,683 pounds, and Colorado 2,493,950 pounds.

California, although ranking first in 1919 and 1909 in amount of honey produced, reported 4,762,977 pounds less in 1919 than in 1909, this being a decrease of 46.4 per cent. Texas showed the greatest absolute increase in production of honey, with 1,932,998 pounds more in 1919 than in 1909. Other notable increases were in Washington (1,092,626 pounds) and Wyoming (945,349 pounds).

The production of wax was 826,539 pounds in 1919, as against 904,867 pounds in 1909, representing a decrease of 78,328 pounds, or 8.7 per cent.

Bees on Farms in the United States, 1920 and 1910, and Production of Honey and Wax, 1919 and 1909, by Geographic Divisions and States

DIVISION AND STATE.	BEES ON HAND (HIVES).		HONEY PRODUCED (POUNDS).		WAX PRODUCED (POUNDS).	
	1920 (Jan. 1)	1910 (Apr. 15)	1919	1909	1919	1909
United States	3,476,346	3,445,886	55,261,552	54,814,890	826,539	904,867
GEOGRAPHIC DIVISIONS:						
New England	41,073	40,627	653,258	594,117	7,546	8,251
Middle Atlantic	262,728	291,659	4,996,894	5,184,165	65,349	66,393
East North Central	556,344	546,938	7,313,401	7,778,545	93,983	132,735
West North Central	503,451	546,693	6,917,867	6,744,608	81,800	93,633
South Atlantic	613,171	678,439	6,579,735	7,362,040	111,613	172,996
East South Central	585,323	506,962	5,653,218	4,477,759	105,281	111,369
West South Central	425,408	379,842	6,422,883	4,486,980	116,757	92,177
Mountain	206,059	172,654	8,746,786	6,577,800	108,558	88,447
Pacific	282,789	282,192	8,027,510	11,608,276	135,652	138,866
NEW ENGLAND:						
Maine	12,639	7,592	209,072	112,051	2,387	2,260
New Hampshire	4,191	4,644	49,512	65,038	386	792
Vermont	10,024	10,215	234,326	160,283	2,137	2,899
Massachusetts	6,573	7,464	70,769	96,802	1,312	1,019
Rhode Island	686	1,267	6,488	14,221	5	185
Connecticut	3,960	9,445	83,091	145,722	1,267	1,096
MIDDLE ATLANTIC:						
New York	127,858	156,360	3,223,323	3,191,738	41,178	43,198
New Jersey	12,451	10,484	157,717	152,072	2,544	1,372
Pennsylvania	122,419	124,815	1,565,854	1,840,360	21,627	21,823
EAST NORTH CENTRAL:						
Ohio	105,675	98,242	835,894	1,001,179	10,790	7,454
Indiana	87,045	80,938	582,380	687,097	8,115	15,115
Illinois	162,630	165,846	1,896,996	1,428,640	21,908	26,240
Michigan	93,348	115,274	1,321,448	2,507,810	20,304	28,524
Wisconsin	107,646	95,638	2,676,683	2,153,819	32,866	55,402
WEST NORTH CENTRAL:						
Minnesota	67,344	56,677	1,251,102	976,262	15,470	16,880
Iowa	138,319	160,025	2,840,025	2,374,080	33,041	44,266
Missouri	157,678	203,569	1,220,611	2,105,815	18,172	23,784
North Dakota	708	495	12,314	11,084	183	92
South Dakota	17,032	6,565	372,092	139,714	3,750	943
Nebraska	41,033	45,625	623,348	527,868	6,144	3,336
Kansas	81,337	73,737	597,875	609,785	5,040	4,332
SOUTH ATLANTIC:						
Delaware	2,976	6,410	27,703	62,777	317	2,756
Maryland	16,117	23,156	215,685	306,367	1,947	4,358
District of Columbia	19	151	315	3,657		
Virginia	104,267	104,005	1,267,300	1,344,360	19,441	23,883
West Virginia	89,873	110,673	919,689	1,550,739	7,786	11,090
North Carolina	163,956	189,178	1,341,002	1,809,127	23,209	76,400
South Carolina	58,028	75,422	441,684	653,119	7,866	12,440
Georgia	136,698	130,549	1,403,869	884,662	28,053	23,443
Florida	41,237	38,895	962,488	747,832	22,094	18,635
EAST SOUTH CENTRAL:						
Kentucky	156,899	152,991	1,604,519	1,558,670	15,521	17,307
Tennessee	191,898	144,481	1,969,425	1,468,123	27,669	28,564
Alabama	153,766	135,140	1,347,644	891,954	41,272	50,043
Mississippi	82,770	74,350	731,680	559,012	20,819	15,155
WEST SOUTH CENTRAL:						
Arkansas	112,475	92,731	791,598	913,515	12,359	20,403
Louisiana	31,079	29,591	247,513	340,134	7,660	12,284
Oklahoma	46,743	19,413	357,677	140,234	2,916	1,088
Texas	235,111	238,107	5,026,095	3,093,097	93,822	58,402
MOUNTAIN:						
Montana	11,918	6,313	630,608	183,510	7,682	594
Idaho	35,900	21,903	1,208,229	1,011,068	16,653	8,018
Wyoming	14,022	4,596	1,084,273	138,924	14,257	1,563
Colorado	63,253	71,434	2,493,950	2,306,492	28,282	33,682
New Mexico	15,733	10,052	593,290	439,528	7,051	5,345
Arizona	28,174	23,770	926,621	1,025,282	10,783	15,012
Utah	25,061	26,185	1,232,239	1,138,091	18,933	16,667
Nevada	11,998	8,401	577,576	354,905	5,917	7,766
PACIFIC:						
Washington	56,806	33,884	1,596,206	508,580	17,420	4,038
Oregon	45,264	47,285	929,566	839,981	11,436	8,383
California	180,719	201,023	5,501,738	10,264,715	106,796	126,445

Another Edition of Cowan

The British Bee Journal announces in a recent number a new edition of Cowan's "British Beekeepers' Guide Book." This is the twenty-fourth edition of this book in the English language. The Guide Book has gone through more editions and been translated into a larger number of languages, probably, than any other book on bees.

Bee Specialist for Washington

Burl A. Slocum has been appointed Bee Specialist in the State of Washington. His time will be equally divided between the Division of Apiculture of the State College of Washington, under Dr. A. L. Melander, and the Extension Service, under Dr. S. B. Nelson. Mr. Slocum is a graduate of the University of Wisconsin in the Beekeeping Course.

Bees Decreasing in South Carolina

There are only 58,028 colonies in South Carolina, as compared to 75,422 ten years ago. The per colony average for 1919 was 8 pounds, or a total of 441,684 pounds.

Beekeeping in Virginia

Virginia produced 1,267,300 lbs. in 1919 from 104,267 colonies of bees, or an average of 11 lbs per colony. There was an increase of only 262 colonies since the 1910 census was taken.

The League

The many friends of E. G. Le Sturgeon, President of the League, will be pleased to learn that he has been chosen as a member of the Texas State Legislature. Mr. Le Sturgeon did not seek this office, but had it practically thrust upon him by his friends. As he is called on every session of the Legislature to give advice, his friends thought the best thing to do was to give him a vote as well as a chance to talk.

It looks like the beekeepers are coming into prominence in many ways. No sooner had Rochester, N. Y., started a move to prohibit the keeping of bees in its limits than New Boston, Ill., took up a similar movement, and now Chicago follows suit. The League is helping the fight against these ordinances.

One of the most hopeful features of the League is that the allied trades and the individual beekeeper are coming to the rescue of the League. Next month we hope to publish a financial statement of the League's current expenses. This will show just how the money is being spent and how badly more is needed.

Colin P. Campbell writes that the 2½-cent rate on honey in the Fordney bill is in line with that on other commodities, and that any attempt to have this rate increased will only open the door to the opposition and most probably to reduction. Every beekeeper should write or telegraph his Senator and Representative to support the proposed tariff on honey as it now stands in the Fordney bill.

Texas Beekeepers Meet

The Texas Beekeepers' Association held its 28th annual summer session at College Station, July 26, 27 and 28. As it was conducted during the Farmers' Short Course, it had the form of a school rather than that of an ordinary association meeting. One very notable fact was that all attending the course were present at every session, from the beginning unto the ending of the meeting. The school was started with the lecture by Dr. L. H. Pammell, of Ames, Iowa, on "The Relationship Between the Honeybees and the Pollination of Farm Crops." Dr. Pammell at one time was a member of the faculty of the Texas A. & M. College and called the attention of the beekeepers to the large number of observations he had made on the value of bees as pollinating agents in Texas. He also called attention to the fact that one market gardener, raising cucumbers under glass, had this spring purchased 200 pounds of live bees to keep in his greenhouses, having no other object than to secure the proper pollination of the cucumber plants.

Dr. M. C. Tanquary, of the Experimental Station, gave an outline of the work which is being done for the beekeepers by the Experiment Station, going into detail with reference to the foulbrood work.

E. C. LeStourgeon, Manager of the Texas Honey Producers' Association, told the school of the market situation and of what had been accomplished and appealed to every beekeeper in the State to help in stabilizing the honey market.

Mr. Lloyd R. Watson gave the beekeepers an excellent account of the behavior of the bees during the swarming period and some results of observations on swarm control in Texas.

Mr. T. W. Burleson, of Waxahachie, gave a full account of shipping bees in combless packages and carefully explained each step in his system, and gave excellent advice to beginners in the combless package business.

Mr. C. S. Rude, State Apiary Inspector, gave a summary of the results of the work in foulbrood eradication for the past three years and showed very definitely from statistics that foulbrood can be controlled and eradicated if the beekeepers will cooperate with the inspectors. Mr. Rude gave some very definite figures relative to the results obtained in counties where foulbrood has been prevalent in the past and stated definitely the policies of his department.

Mr. E. B. Ault, of Calallen, gave his system of apiary management and explained to the beekeepers how system was absolutely necessary to get results in managing any number of colonies of bees.

Mr. E. W. Atkins, of the G. B. Lewis Company, gave very briefly the advantages of standard equipment. He stated that the kind of a hive had little to do with the amount of production, that it was the beekeeper and his management that governed the

amount of honey obtained. He further stated that no matter what hive a man used, whether home-made or factory-made; that he should have for his own yards a standard equipment and, of course, if the standard equipment used is also the standard of his neighbors, that it would be to his advantage in that he could buy and exchange bee fixtures if such a thing would become necessary, with the least possible trouble. He stated that the use of the standard equipment saved the beekeeper one-third of his time.

W. O. Victor, of Uvalde, gave an excellent summary of a year's work in beekeeping and told the beginners or unsystematic beekeepers the absolute importance of doing certain things at stated, definite periods. Mr. Victor is looked upon as being one of the best instructors in beekeeping in the State.

R. R. Reppert, Extension Entomologist, told the beekeepers of their relationship to the beginners in beekeeping and box-hive beekeepers and asked for the support of the Beekeepers' Association to help in bettering the conditions of beekeeping throughout the State and to help in the securing of one man in the Extension Department to devote his whole time to extension work in beekeeping.

A. H. Alex, queen breeder for the Experiment Station, told of the work in the experimental queen yard and gave a system of queen raising for the individual beekeeper.

Louis H. Scholl, of New Braunfels, gave a summary of his system of beekeeping, which is grouped about the divisible brood-chamber, and told of its developments. He stated that after seventeen years of commercial bee work in which the divisible brood-chamber was used, that he was now a stronger believer in this form of hive than he ever had been.

H. B. Parks, Secretary of the American Honey Producers' League, spoke on the relationship of bees to their locality, stating that the beekeeper must know his territory and must know the relationship that exists between the bees, the flora, the climatic conditions and geographical locations before they can rightly handle the problems of beekeeping. He stated, further, that the Isle of Wight disease would have been explained long ago if locality had been studied as diligently as disease symptoms. He advanced the theory that the mite causing this disease was an active parasite on some solitary bee in the Isle of Wight, and attacked the honey bee upon its introduction to that island. In light of this fact, investigators in the diseases of bees should not limit their study to the honeybee, but should also carefully study the closely related forms.

W. A. Black, of San Antonio, called the beekeepers' attention to their relationship to their communities, and to the State, in matters of local government and the improvement of the political situation of the country, as well as the commercial.

Seventy dollars was subscribed to

the Dr. Miller Memorial Fund by beekeepers present who had not already subscribed.

The meeting was voted as a decided success by those present and it was further agreed to meet with the College Short Course again next year.

The officers for the following year are: T. W. Burleson, Waxahachie, Texas, President; Wm. Zimmerman, Vice President; Alma M. Hasslbauer, Secretary-Treasurer; W. O. Victor, Superintendent of Fair Exhibits, and H. D. Murry, Judge of Exhibits.

H. B. Parks.

San Antonio, Texas.

Pears Two-Thirds Average Crop

The July 1 forecast of production of pears is 9,016,000 bushels for the United States, which is about two-thirds the five-year average, and may be compared with last season's estimated crop of 17,270,000 bushels. Leading producing States include New York, 1,329,000 bushels; California, 2,656,000 bushels; Washington, 1,456,000 bushels; Michigan, 505,000 bushels.—U. S. Market Reporter.

More Sugar Beets in Germany

The acreage in sugar beets in Germany during 1921 exceeds that of 1920 by 149,730 acres. The total area sowed to sugar beets in 1921 is placed at 813,024 acres, as compared with 668,294 acres during 1920.—U. S. Market Reporter.

Bee Specialist for Virginia

F. S. Andrews has recently been appointed Bee Specialist of the Extension Department of the Agricultural College at Blacksburg, Va. Virginia is doing much to encourage the development of all lines of agriculture within her borders and we are glad to note that beekeeping will not be neglected.

California County Crops

In a recent issue we gave figures showing the total honey crop for California in 1919 as 5,501,738 lbs.

Figures are now available for each county. The counties reporting the largest crops are, in order:

San Bernardino County, 536,935 pounds.

Los Angeles County, 519,019 lbs.

San Diego County, 480,165 lbs.

Riverside County, 480,016 lbs.

Contra Costa County, 285,683 lbs.

Those reporting the least crops are, in order:

Plumas County, 1,683 lbs.

Santa Cruz County, 2,646 lbs.

Mariposa County, 2,670 lbs.

Yuba County, 3,344 lbs.

Bees in Georgia

Georgia reports production of 1,403,869 pounds of honey in 1919 from 136,698 colonies of bees, or a per colony average of 11 pounds. There are more bees in Georgia than in 1919 by 6,000 colonies.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 20th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

BEEES AND QUEENS

ATWATER HONEY—Supply your customers.

CARNIOLANS—Gentle, prolific, wonderful honey gatherers. Descriptive circular free. Untested queens, \$1.50 each; \$17 per dozen. September is not too late to requeen.

A. C. Hann, Glen Gardner, N. J.

FOR SALE—200 colonies Italian bees in 2-story 10-frame hives. No disease. Modern outfit, in A1 condition. H. A. Jett, R. 1, Box 155, Tucson, Ariz.

QUEENS from my 315 lb. mother Leather colored, untested, \$1.10; 6, \$6.

R. Kramke, 1104 Victor, St. Louis, Mo.

FOR SALE—Select golden Italian queens by return mail. Untested, \$1.50; \$15 per doz. Tested, \$2.50. Wallace R. Beaver, Lincoln, Ill.

BEEES—100 colonies for sale.

E. F. Atwater, Meridian, Idaho.

FOR SALE—Highest grade three-banded Italian queens. Select untested, 1, \$1; 6, \$5.50; 12, \$10; 100, \$75. Virgins, 45c. No disease, and satisfaction guaranteed.

A. E. Crandall, Berlin, Conn.

FOR SALE—Three-banded Italian queens, untested queens, \$1 each; 6, \$5; 12, \$10. Select untested, \$1.10 each; 6, \$5.50; 12, \$11. Safe arrival and satisfaction guaranteed. Alabama Bee Co., R. 1, Fort Deposit, Ala.

SWARTS' golden queens produce golden bees of highest quality. Untested, \$1.25 each; 6 for \$7; tested \$3. Satisfaction guaranteed. D. L. Swarts, Lancaster, Ohio. Rt. 2.

SPECIAL—Leather Italian queens, untested, 90c; two or more, 65c. One to three-frame nuclei, with queen, \$3 to \$5. Booking orders for 1922 packages nuclei and queens. Tupelo Honey Co., Columbia, Ala.

FOR SALE—Fine 3-banded Italian queens, untested, \$1 each; 50 for \$47.50; 100 for \$92.50. Curd Walker, Jellico, Tenn.

HARDY ITALIAN QUEENS in Thompson safety introducing cages. Day old, any number, 50c each; untested, \$1. Package bees and queens for 1922. Write for prices and discounts on orders booked now.

James McKee, Riverside, Calif.

FOR SALE—80 colonies in 10-frame hives, \$10 per hive. Dr. T. A. Kragness, 6081 Wentworth Ave., Chicago, Ill.

THAGARD'S ITALIAN QUEENS—I am breeding from breeders obtained this spring from Italy. Untested, \$2 each; 12, \$18. Queens from my famous stock, untested, \$1.25 each; 12, \$11.50.

V. R. Thagard, Greenville, Ala.

FOR SALE—Three-banded Italian queens, \$1.25 each; \$12 per dozen. Tested, \$2. Jul. Buegeler, New Ulm, Texas.

FOR SALE—400 stands clean bees, extracting equipment; good location; for season write. The Oregon Apiary Co., Nyssa, Oregon.

THREE-BAND and GOLDEN QUEENS—Reared in separate yards. Order from us and get pure stock for your summer and fall requeening. At our special price, beginning July 1, untested, \$1.25 each; 12, \$1.00 each; tested, \$2.00 each. We have a good number ready for shipment and will fill your order promptly. Dr. White Bee Co., Sandia, Texas.

WE BELIEVE we have the best Italian queens obtainable. Our new system is working wonders. Untested, \$1.25; tested, \$2.25; virgins, 50c. Am booking orders for 1922. F. M. Russell, Roxbury, Ohio.

FOR SALE—Golden Italian queens, untested, \$1; 6 for \$5. Tested queens, \$2. J. F. Michael, Winchester, Ind.

PROMPT SHIPMENT of golden or 3-banded queens. Untested only. One, \$1.25; 6, \$7; 12, \$13. Safe arrival and satisfaction. Ross B. Scott, La Grange, Ind.

FOR SALE—Pure 3-banded Italian queens, reared from the best honey-producing mothers, mated to pure drones. Untested, each, \$1.25; 6, \$7; 12, \$13. Tested, each, \$2.50. H. N. Boley, Hillsboro, Iowa.

FOR SALE—Three-banded Italian queens, untested, \$1.25 each; 6, \$7.50; 12, \$14. Tested queens, \$2.50 each; 6, \$16. The above queens are select stock. Safe arrival and satisfaction guaranteed. Rob't B. Spicer, Wharton, N. J.

MY famous three-banded Italian queens, \$1.50 each, 6 for \$8, after June 1. J. W. Romberger, Apiarist, 3113 Locust St., St. Joseph, Mo.

SIMMONS QUEENS, bees and nuclei; goldens and three-band. Fairmount Apiary, Livingston, N. Y.

HARDY ITALIAN QUEENS, \$1 each. W. G. Lauver, Middletown, Pa.

FOR SALE—Unsurpassed Italian queens, ready June 1; untested, \$1.50; 6, \$7.50; 12, \$14; 50, \$55; 100, \$105. Tested, 1, \$2.50; 6, \$13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

FOR SALE—Hardy northern bred Italian queens and bees, each and every queen warranted satisfactory. For prices and further information write for circular. H. G. Quirin, Bellevue, Ohio.

BEEES AND QUEENS from my Carolina apiaries, progeny of my famous Porto Rican pedigree breeding stock. Elton Warner, Asheville, N. C.

FOR SALE—Leather colored Italian queens, tested, until June 1, \$2.50; after, \$2. Untested, \$1.25; 12, \$13. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

FOR SALE—Root's strain of golden and leather-colored Italian queens; bees by the pound and nuclei. Untested queens, \$1.50 each; select untested, \$2 each; tested, \$2.50 each; select tested, \$3 each. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

WE are booking orders for our golden Italian queens for spring delivery after April 15. Untested queens, 1, \$1.50; doz., \$15; select untested queens, 1, \$1.75; doz., \$18; virgin queens, 1, 75c; doz., \$9; tested queens, 1, \$3; doz., \$36. Safe arrival guaranteed. Tillery Brothers, Georgiana, Ala.

BOOK YOUR ORDERS for QUEENS now—Goldens, \$2; tested, \$3; banded, \$1.50; tested \$2.50; six or more, 10 per cent less. Clover Leaf Apiaries, Wahoo, Neb.

EDSON APIARIES now booking orders for queen bees for delivery during season of 1921. Prices: One untested queen, \$1.75; 50 untested queens, \$57.50; 100 untested queens, \$100. Orders filled in rotation; first shipments March 1, 1921. Edson Apiaries, Gridley, Calif.

BEEES AND QUEENS from my New Jersey apiary. J. H. M. Cook, 1A1f 84 Cortland St., New York City.

BEEES BY THE POUND, ALSO QUEENS—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

TRY my Caucasian queens, \$1.25 each; hybrids 35c each. Peter Schaffhauser, Havelock, N. C.

ITALIAN QUEENS, \$1 each, or \$10 per doz., after June 1. Will book a few more three-frame nuclei of black or hybrid bees with Italian queen, for delivery after June 15, at \$5 each, or 3 lbs. bees on frame of honey for \$4.25. These will be fine to winter for early spring work. Otto Diestel, Elza, Ga.

HUMMER QUEENS—Untested, \$1 each, \$9 per dozen. Tested \$1.50 each, \$15 per dozen. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old price. Geo. A. Hummer & Sons, Prairie Point, Miss.

FOR SALE—Golden Italian queens, untested, \$1.15, 6 for \$6.50; 12 or more, \$1 each; tested, \$2 each; select tested, \$3 each; extra select tested, \$4 each. No bees for sale. D. T. Gaster, Randleman, R. D. 2, N. C.

FOR SALE—3-banded Italian queens, untested \$1.25 each; 6, \$6.50; 12, \$12. Select untested, \$1.50 each. Satisfaction guaranteed. W. T. Perdue & Sons, Rt. No. 1, Fort Deposit, Ala.

FOR SALE—Golden Italian queens, untested, 1, \$1.25; 6 \$7. E. A. Simmons, Greenville, Ala.

YOU CAN SAVE queens by using All Right push-in comb introducing cage, 25c, post paid. O. S. Rexford, Winsted, Conn.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness and perfect markings. Price after July 1, \$1.25 each; one dozen or more, \$1 each. Package bees a specialty. Send for circular. J. H. Haughey Co., Berrien Springs, Mich.

WE are offering for remainder of season our bright Italian queens, untested at \$1 each, \$10 per dozen, \$75 per hundred. We guarantee safe arrival, pure mating and reasonable satisfaction in United States and Canada. Cash must accompany all orders unless parties are known or satisfactorily rated. Graydon Bros., Rt. 4, Greenville, Ala.

FOR SALE—Burleson's three-banded Italian queens. The kind of bees that get the goods. Guaranteed to please or money back. For balance of season as follows: 1 select untested queen, \$1.25, 6 for \$7, 12 for \$13.50, 100 or more \$1 each. Send all orders, together with remittance, to J. W. Seay, manager, Mathis, Texas. T. W. Burleson, Waxahachie, Texas.

FOR REQUEENING use Williams' heavy laying Italian queens; they produce hardy, hustling three-banded workers. Bred from the best disease-resisting strain, and priced in accordance with the present price of honey. Untested, \$1.25, 6 for \$6.50, 12 or more \$1 each; tested, \$2. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

WANTED—We have many calls from educators for copies to complete their files of the older Bee Journals. If you have complete volumes or miscellaneous numbers of any Bee Journals previous to 1900, write us, giving a list, and we will be glad to quote a price. Old bee books, now out of print, are also desirable. We act as a clearing house for this kind of materials. American Bee Journal, Hamilton, Ill.

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction top pails. Prices on application.

Early order cash discount on sections, hives, supers, frames, comb foundation and other goods.

Buy now and get supplies ready for 1922. Make out your list and send for our prices.

AUGUST LOTZ COMPANY, Boyd, Wisconsin

WE are now equipped to handle your early spring orders for package bees and queens, especially bred for the production of honey. Our queens are bred from the best stock obtainable, and will give satisfaction. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

FOR SALE—Italian queens, untested, 1 for \$1.25, 6 for \$7, 12 for \$13.50. Tested, \$2. Mismatched queens will be replaced if returned in 30 days; dead queens will be replaced if returned by return mail. I have tested breeder from the A. I. Root Co., and will breed queens from her for those that prefer them to my old strain of hustlers. R. B. Grout, Jamaica, Vt.

CALIFORNIA ITALIAN QUEENS at special prices. After June 15 and to October 1, 1, \$1.25; 6, \$7; 12, \$13; 25 and over, \$1 each; 100, \$90. See larger ad elsewhere. Circular free. J. E. Wing, 155 Schiele Ave., San Jose, Cal.

NUCLEI—We make a specialty of shipping 2-frame nuclei. Write for special prices for June delivery. Queens at the following prices: Untested, \$1.50 each; 6, \$8; 12, \$15; 50, \$60; 100, \$100. Tested queens, \$2.50 each. Cotton Belt Apiaries, Roxton, Texas.

LARGE, HARDY, PROLIFIC QUEENS—Three-band Italians and goldens, pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness and color. After June 1, untested queens \$1.50 each, 6 for \$8, 12 or more \$1.40 each, 25 or more \$1.25 each. Tested queens \$3 each, 6 for \$16. Buckeye Bee Co., Justus, O.

HONEY AND BEESWAX

ATWATER HONEY—Supply your customers.

HONEY—SUPPLY YOUR CUSTOMERS—Finest alfalfa-clover honey, extra strong cases, case of two 5-gal. cans, \$12; case of six 10-lb. pails, \$7.20; case of twelve 5-lb. pails, \$7.80, all f. o. b. here. E. F. Atwater, Meridian, Idaho.

FOR SALE—Raspberry-milkweed honey in 60-lb. cans. Also light amber honey. P. W. Sowinski, Bellaire, Mich.

FOR SALE—No. 1 white comb, \$6 per case; No. 2 white comb, \$5 per case of 24 sections; six cases to carrier. Clover extracted, in two 60-lb. cans to case, 15c per pound; 5-lb. pails, \$1 each, 12 to case. Amber baking honey, two sixty-lb. cans to case, 10c per pound; same honey in 50-gallon barrels, 8c. H. G. Quirin, Bellevue, Ohio.

FOR SALE—New crop choice clover extracted honey packed in new cans and cases at wholesale price of \$14.85 per case of two 60-pound cans, and \$14.40 per case in orders of five cases or more. I will have only a half crop. A few cases of last year's clover honey at 10c. No. 1 comb honey \$48 per carrier of 8 cases. No better honey is produced than mine. Sample 20c. J. D. Beals, Oto, Iowa.

FOR SALE—Extra fancy white clover honey, well ripened and put up in new cans, 60 pounds net; per case of two cans, \$16. Write for special price on large quantities. Edw. A. Winkler, Joliet, Ill.

WANTED—Pure white clover extracted and comb honey. Send sample and price wanted. F. L. Hostetter, Osceola, Mo.

EXTRA FINE white sweet clover honey, new crop, in 5-gallon cans, cases of 2 cans, \$15; 1 can, \$8. Write for prices on a ton or a car load. Sample 10c. C. S. Engle, 200 Center St., Sioux City, Iowa.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white; indeed, I doubt if the color, body and flavor can be beaten. Put up in 60-lb. cans, 2 to the case, at 15c per pound, or in 5-pound pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, Rt. 5, Bay City, Mich.

HONEY FOR SALE—In 60-lb. tins, water white orange, 14c; water white sweet clover, 12c; extra light amber same, 11c; New York State buckwheat, 10c, for immediate shipment, from New York. Hoffman & Hauck, Inc. Woodhaven, N. Y.

FOR SALE—Finest Michigan raspberry, basswood and clover No. 2 white comb, \$5.50 per case; No. 1, \$6; fancy, \$6.50; extra fancy, \$7. 24 Danz. sections to case. Extracted, 60-lb. cans 15c per lb. W. A. Latshaw, Clarion, Mich.

FOR SALE—Extracted honey. Write for prices. A. L. Kildow, Putnam, Ill.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering. Fred W. Muth Co., 204 Walnut St., Cincinnati, Ohio.

HONEY WANTED—Give particulars in first letter. Elton Warner, Asheville, N. C.

SUPPLIES

ATWATER HONEY—Supply your customers.

SAVE MONEY on your shipping cases, tin and glass honey containers, etc. Our free price list tells you how. If you rear queens for sale, be sure to send for our price card of mailing cages. The Rattray-Hamilton, Co., Almont, Mich.

NOVICE EXTRACTORS, \$22, Cowan reversible, \$30; 100 5-lb. pails, \$8.50; 100 10-lb. pails, \$11. Wanted—Comb and extracted honey. R. Kramske, 1104 Victor, St. Louis, Mo.

FOR SALE—A quantity of shipping cases to hold 24 sections 4x5x1½ or 1¾, with glass, complete, cases of 25 for \$10. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—Western beehives, standard sizes, manufactured from red cedar and white pine; odd sizes made to order. Williams Bros., 5125 82nd St., S. E. Portland, Ore.

EXTRACTOR BARGAINS—New Cowan, takes Jumbo frames, \$36. Practically new Novice, \$26. Lorenzo Clarke, Winona, Minn.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list. The Colorado Honey Producers' Association, Denver, Colo.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list. American Bee Journal, Hamilton, Ill.



Southern Headquarters

RELIABLE THREE-BANDED ITALIAN QUEENS

BY RETURN MAIL

For many years queens from our stock have been used and recommended by a number of the largest producers of honey in the U. S. and Canada. We cannot afford to disappoint them, and we will not disappoint you.

Having several hundred colonies in outyards to select the very best breeding stock from, and large well-equipped queen-rearing yards, we offer you something good.

We pay special attention to honey-gathering qualities, but do not forget gentleness beauty, etc. The Back-lot Buzzers like them just the same as the larger producers.

PRICES NOW—Untested: 1, \$1.00, 6, \$5.50; 12, \$10.50; 25, \$20.00; 50, \$38.00. Tested: 1, \$1.75; 6, \$10.00

Prompt service, safe arrival and satisfaction we guarantee

W. D. ACHORD, Fitzpatrick, Ala.



3-Banded Queens, Package Bees, Golden Queens

We are booking orders for 1922 delivery. Do not care to accept any more business for 1921 delivery after September 10. We wish to thank our many friends for their kind and, indeed, generous patronage during the present year, and we hope to serve them even better the coming season, 1922. Our bees and service will be better the coming year than ever before. Let us know your wants and get our lowest prices, delivered, safe arrival and satisfaction guaranteed.

M. C. BERRY & CO.

HAYNEVILLE, ALA., U. S. A.

FOR SALE

ATWATER HONEY—Supply your customers.

FOR SALE—400 colonies of bees in standard 8 and 10-frame hives; also, 10,000 lbs. of clover-basswood honey in 60-lb. tins.
C. E. Keister, Orangeville, Ill.

FOR SALE—Extra fine clover honey in new 60-lb. cans, two to the case, at \$16; also in 30-lb. cans at \$3.75 for one can.
Martin Carsmoe, Ruthven, Iowa.

FOR SALE—40 colonies of bees in standard dovetailed hives, with wired frames. Bees healthy. Write for particulars.
Duane Shaw, Palestine, Ill.

FOR SALE—New white clover-basswood extracted honey, 60-lb. cans; buckwheat in 60-lb. cans and kegs. Write for prices.
E. L. Lane, Trumansburg, N. Y.

FOR SALE—66 hives of bees, no disease; 100 bodies, and 1,000 frames in flat; 140 Ideal supers; 110 pounds foundation; 250 chickens; cow, some furniture, etc., located 9 miles from Richmond, Va; for quick sale \$1,000.
T. McLaine, Rt. 1, Rio Vista, Va.

FOR SALE—1,000 colonies of bees located around Brawley, Calif., in the Imperial Valley, where crop failure is unknown. Portable Extracting outfit, two autos and one 1½-ton truck, storage tank, honey house and dwelling house. Bees in two-story 10-frame hives; no queen over one year old. This is a going concern and a money maker. If you want an outfit of this size and mean business, come look us over. Half cash, balance as you make it. Reason for selling, going to South America this fall. T., care American Bee Journal, Hamilton, Ill.

FOR SALE—350 colonies of a fine strain Italian bees; all supplied well with honey. Write for full particulars. Chas. Heim & Sons, Three Rivers, Texas.

FOR SALE—Cedar or pine dovetailed hives; also full line of supplies, including Dadant's foundation. Write for catalog.
A. E. Burdick, Sunnyside, Wash.

FOR SALE—Comb honey, fancy, \$6.50; No. 1, \$6. Only in 8 case lots.
W. L. Ritter, Genoa, Ill.

FOR SALE—Hamburg chickens; rare old violin. Elias Fox, Union Center, Wis.

FOR SALE—"Superior" Foundation (Weed process). Quality and service unexcelled.
Superior Honey Co., Ogden, Utah.

WANTED

ATWATER HONEY—Supply your customers.

Wanted—First editions of the noted books on bees.
Mrs. M. J. Fox, Foxden, Peekskill, N. Y.

WANTED—Honey, section, bulk comb and extracted. W. A. Hunter, Terre Haute, Ind.

WE BUY honey and beeswax. Give us your best price, delivered in New York. On comb honey, state quantity, quality, size and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples.

Charles Israel Bros. Co.,
486-490 Canal St., New York City.

WANTED—Beeswax, also old combs and cappings to render on shares; will buy your share and pay the highest market price.
F. J. Rettig, Wabash, Ind.

WANTED—Light extracted in 60-lb. cans. Send sample with price delivered in Chicago.
R. J. Dietmeyer,
8621 S. Sangamon St., Chicago, Ill.

WANTED—Extracted honey. Send prices and samples. Will exchange Haywood vulcanizing outfit for honey, worth \$4.50, with tools and equipment. Chris Bahr, Cathay, N. Dak.

WANTED—Beeswax, old combs and cappings for rendering on shares. Also wax accepted for trade. Top market prices offered.
A. I. Root Co., Council Bluffs, Iowa.

**MONEY
SAVED**

*Why haven't
you clipped
this coupon?*

IS MONEY MADE

**THAT IS WHY YOU
WILL WANT TO SEND
US THIS COUPON AT
ONCE. WE HAVE
SOME MONEY SAV-
ING PRICES FOR YOU**

The A. I. Root Co. of Iowa, Council Bluffs, Iowa

GENTLEMEN: Kindly name your special fall prices on

- ☐ Eight frame hives, metal cover, complete
- ☐ Eight frame bodies, with frames, complete
- ☐ Shipping cases in lots of _____
- ☐ Cans, jars and pails, also second hand 5 gal. cans
- ☐ Honey tanks

☐ As I am anxious to make the most of my honey production, please send me your service bulletin "Bee Topics." I am interested in your September's issue treating principally with market conditions, and your

suggestions as to increasing sales. I have _____ colonies

_____ frame hives. For your further information I wish to state that

Name _____

Address _____

THE A. I. ROOT CO. OF IOWA

COUNCIL BLUFFS, IOWA

WANTED—A No. 1 light clover honey; quantity depends on quality. Emil Strudel, 1461 Richard St., Milwaukee, Wis.

WANTED—Bees in colonies, comb and extracted honey. Frank Coyle, Penfield, Ill.

WANTED—Your order for "Superior" Foundation. Prompt shipments at right prices. Superior Honey Co., Ogden, Utah.

SITUATIONS

ATWATER HONEY—Supply your customers.

WANTED—A man who thoroughly understands the care of bees; a good job for the right party. References required. Address R. T. Parker, 69 Appleton Ave., Pittsfield, Mass.

MISCELLANEOUS

ATWATER HONEY—Supply your customers.

GRANULATED HONEY SLIPS—Small and neat. They save complaints. Thousands are being sold; 100, 20 cents; 500, 80 cents; 1,000, \$1.50. Dr. Bonney, Buck Grove, Iowa.

SAMPLE FREE—They say "It's as good now as when Hutchinson ran it." Under new ownership, our bee journal is growing fast, better every issue, a "different" kind of a journal. Let's get acquainted. \$1.50 a year, and worth it.

The Domestic Beekeeper, Lansing, Mich.

LEAGUE EMBLEMS—We still have a number of U. S. Beekeepers' emblems, buttons or pins, bronze or gold. Send 50 cents and get one

American Bee Journal, Hamilton, Ill.

QUEENS

I. F. MILLER'S strain Italian Queen Bees, northern bred, for business; from my best SUPERIOR BREEDERS (11 frames brood on April 7), gentle, roll honey in, hardy, winter well, not inclined to swarm, 3-banded; 27 years breeding experience. Satisfaction guaranteed in U. S. and Canada. 1 unt., \$1.25; 6 for \$7; 12 for \$13. 1 sel., \$1.50; 6 for \$8; 12 for \$15. 1 test., \$2.00; 6 for \$11; 12 for \$21.

I. F. MILLER, Brookville, Pa.
Route No. 2.

GOLDEN QUEENS 1921

Golden and three-band queens, untested \$1 each, or 6 for \$5; \$80 per 100. Virgin queens 50c each, or \$40 per 100. All orders will be filled promptly, or parties notified just when to look for them. Reasonable satisfaction to everybody.

R. O. COX, Rt. No. 4, Luverne, Ala.



HONEY FINEST Michigan Raspberry Basswood and extracted honey. Unexcelled for quality.

Crate 6 cases 24 sec. Fancy comb \$39.00
Crate 6 cases 24 sec. A No. 1 co'b 36.00
Crate 6 cases 24 sec. No. 2 comb 33.00
Crate 6 cases 24 sec. extra fancy 42.00
Two cans 120 lbs., extracted 18.00

Send Today for Free Sample

W. A. LATSHAW COMPANY, Clarion, Michigan

SHE-SUITS-ME queen-bees, prices for 1921: Untested Italians, \$2 each; \$1.75 each for 10 or more, prior to June 15. After June 15, 1 to 9 queens \$1.50 each, 10 to 24 \$1.40 each, 25 and up \$1.25 each.

ALLEN LATHAM,
Norwichtown, Conn.

Quality Bee Supplies

FROM A

Reliable House

Without fear or favor, I place my BEE SUPPLIES and SERVICE before you.

It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S GOODS.

Quality is first—save time when you put your goods together, by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

I am ready to meet your urgent needs.

Send for my new price list.

Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames and eight-frame D. T. supers for 4x5 sections. Will sell at cost price. Write for quotations.

CHAS. MONDENG

146 Newton Ave. N. and 159 Cedar Lake Rd. Minneapolis, Minn.

Nuclei For Sale—1922 Prices

Book early to get the best shipping dates. Experience has taught us that the three-frame nuclei is the right size to build up for the clover flows of the North, providing you get them by May 15. I make a specialty of the three-frame size, having shipped over 1,200 with only a loss of 6 last season.

Note what one of the largest beekeepers in the North says: "I have no hesitation in recommending you as to ability to put up bees for shipment, or as to your business integrity. Of the 225 nuclei sent to date, every one came through alive and in fine condition." (Name on request.) Although we sold our nuclei at really pre-war prices last season, I am still making a further reduction.

Price List of Our Goods

3-frame nuclei hybrid bees, guaranteed pure Italian queen, \$5.00 each
3-frame nuclei Italian bees, with Italian queen ----- 6.00 each
3-frame nuclei black bees and black queen ----- 4.00 each
Cypress hives, complete, crate of 5 ----- \$13.00
Medium brood foundation, per lb. ----- .68

I am always buying and establishing new yards, is the reason I can sell the black bees with success. Perfect satisfaction guaranteed. Terms one-third down to guarantee acceptance.

A. R. IRISH, Ludowici, Ga.

SEVEN QUEENS

For \$6.00

Pure mated, gentle 3-band Italian queens, untested \$1 each, 7 for \$6. Select untested \$1.25 each; tested, \$1.75.

Requeen Now

Orders Filled Promptly.

D. W. HOWELL, Shellman, Ga.

WESTERN BEEKEEPERS!

We handle the finest line of bee supplies. Send for our 68-page catalog. Our prices will interest you.

The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

MOTT'S NORTHERN BRED ITALIAN QUEENS

Have a World-wide reputation. Sel. Unt., 1, \$1.25; 6, \$7.50; 12, \$15. Sel. guaranteed pure mated or replace, 1, \$1.75; 6, \$10; 12, \$18. Sel. tested, \$2.50 each.

Filling orders by return mail at this present writing by the aid of my Southern branch. Plans, "How to Introduce Queens" and "Increase," 25c. E. E. MOTT, Glenwood, Mich.

A NEW BEE BOOK

"Dadant's System of Beekeeping"

Send for a copy today.

Price \$1.00.

HONEY

The World's Best Sweet for Children

NOW IS THE TIME TO SELL YOUR

HONEY

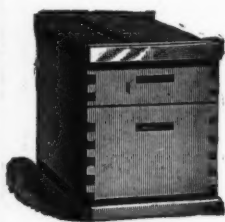
We are the largest distributors of Bulk Honey imported and domestic in the United States

WE CAN SELL YOUR HONEY

Write us today, state the quantity and quality, how packed, shipping point and carload and L. C. L. freight to New York and mail liberal size sample. Include in your first letter your idea of price

PATON & COWELL

217 Broadway, New York



MR. BEEKEEPER—

We have a large plant especially equipped to manufacture the supplies that you use. We guarantee all materials and workmanship. We ship anywhere. We allow early order discounts and make prompt shipments. *Write for free illustrated catalog today*

LEAHY MFG. CO., 90 Sixth Street, Higginsville, Missouri
J. W. ROUSE, Mexico, Missouri **A. M. HUNT, Goldthwaite, Texas**

TENNESSEE-BRED QUEENS

Forty-nine Years' Experience in Queen-Rearing
 Breed Three-Band Italians Only

	Nov. 1st to June 1st			June 1st to Nov. 1st		
	1	6	12	1	6	12
Untested Queens.....	\$2.00	\$ 9.00	\$16.80	\$1.50	\$ 8.00	\$14.50
Select Untested.....	2.25	10.50	18.00	2.00	9.50	16.00
Tested.....	3.50	20.00	35.00	2.50	13.00	25.00
Select Tested.....	4.00	22.50	40.00	3.00	16.00	30.00

Select tested, for breeding \$7.50

The very best queen tested for breeding \$15

Capacity of yard 6000. I sell no bees by the pound or nuclei except with high priced tested and breeding queens

Queens for export will be carefully packed in long distance cages, but safe delivery is not guaranteed

JOHN M. DAVIS, Spring Hill, Tenn.

Five colonies of your stock produced 2660 finished sections—the best one 616 finished sections
 JOHN M. BIXLER, Corning, Iowa, February 1, 1921

MAKE YOUR BEES PAY

If you want bigger honey profits, *get the best queens you can buy.* This is the secret of successful bee raisers. Hundreds of America's greatest honey producers order Forehand's 3-banded Italian Queens. Follow their example. Order from Forehand and be sure of satisfactory results. Backed by 28 years' successful experience in queen breeding and honey production. Take no chances. Experimenting is costly. So certain am I that my queens will satisfy you that I will gladly replace unsatisfactory queens delivered in the United States or Canada, or refund your money. You be the judge and jury. Can anything be fairer?

PRICES—Aug. 1 to Nov. 1.

	1	6	12
Untested	\$1.00		\$10.00
Select untested	1.25		12.00
Tested	2.50	\$13.00	24.00
Select tested	3.00	16.50	30.00
Bees in 2-lb. packages—1 package, \$6; 25 or over, \$5.80; 50 or over, \$5.40; 100 or over, \$5; without queens.			

Place your order now. Prices low, quality considered. Write for circular and discounts on large orders.

N. FOREHAND
 RAMER, ALA.

Breeder of 3-banded Italian Queens exclusively

BEE SUPPLIES

We carry a complete stock of supplies at all times, and can make prompt shipments. Our prices will interest you.

Send Us Your Inquiries

A. H. RUSCH & SON CO.
 Reedsville, Wis.



Shrubs and Trees

That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.
PROGRESS NURSERIES
 1318 Peters Ave. Troy, Ohio

Annual White Sweet Clover Seed

(James or Alabama Strain)

Start right. Buy your seed from the home of this New Plant.

This clover was discovered growing in Alabama by our Mr. James, in 1919.

Our crop this year was harvested without rain, and we can furnish a very high grade of seed, absolutely pure, grown by us on cultivated lands.

We are offering a limited supply at \$2 per pound, delivered. This will be clean, hulled, scarified seed. Germination test must please you. Write for further information as to how to grow, etc.

F. A. James Clover Seed Co.
 Newbern, Alabama

QUEENS OF MOORE'S STRAIN OF ITALIANS

Produce Workers

That fill the supers quick
 With honey nice and thick

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc.
 Untested queens, \$1.50; 6, \$8; 12, \$15.
 Select untested, \$2; 6, \$10; 12, \$19
 Safe arrival and satisfaction guaranteed.
 Circular free.

I am now filling orders by return mail.

J. P. MOORE, Queen Breeder
 Route 1 Morgan, Ky.

QUINN'S QUEENS OF QUALITY

Have no superiors—"There's a reason." Are Mandelion bred, good qualities accentuated. Gray Carniolans, Gray Caucasians, most gentle of all, prolific, hardy, vigorous, disease-resisting white comb builders—they deliver the goods.

ITALIANS, 3-banded, line-bred, pedigreed; need no boosting; they speak for themselves.

CHAS. W. QUINN, Sabot, Va.

HONEY**WANTED****HONEY**

We are in the market for both comb and extracted. Send sample of extracted, state how put up with lowest price delivered Cincinnati. Comb honey, state grade and how packed with lowest price delivered Cincinnati. We are always in the market for white honey if price is right.

C. H. W. WEBER & CO., 2163-65-67 Central Ave., Cincinnati, O.

QUEENS**PACKAGE BEES**

FULL COLONIES AND NUCLEI

QUEENS

Our bees are hustlers for honey, prolific, gentle, very resistant to European foulbrood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the United States and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock; best we ever had. The bees we got from you are the tops (best) out of our 225 colonies; bees arrived in fine shape, well pleased," etc. Write for free circular giving details, etc.

We are quoting a lower price for balance of the year, but will still hold up the high standard of Quality First. I have a good proposition for two or three Northern men wanting to come South this fall. Write for particulars.

Queens after July 1st, balance of the year:

Untested	\$1.35 each, 25 or more \$1.00 each	1 pound pkg. bees,	\$2.25 each; 25 or more, \$2.13 each
Select Untested	\$1.50 each, 25 or more \$1.25 each	2 pound package bees	\$3.75 each; 25 or more, \$3.56 each
Tested	\$2.25 each, 25 or more \$1.75 each	3 pound pkg. bees,	\$5.25 each; 25 or more, \$4.98 each
Select Tested	\$2.75 each, 25 or more \$2.00 each	Add price of queen wanted when ordering bees. Safe arrival guaranteed within 6 days of here.	
Breeders	\$5.00 to \$15.00		

NUECES COUNTY APIARIES, E. B. AULT, Proprietor CALLEEN, TEXAS

HONEY CANS

Several carloads just received at our Ogden, Utah and Idaho Falls, Idaho warehouses. We also manufacture shipping cases and dovetailed beehives. Special prices on request. "Everything in bee supplies." Prompt shipments

SUPERIOR HONEY CO., Ogden, Utah

(Manufacturers of Weed Process Foundation)

Three-Banded Leather-Colored Italian Queens

Bred from Selected Root Home-bred Breeders

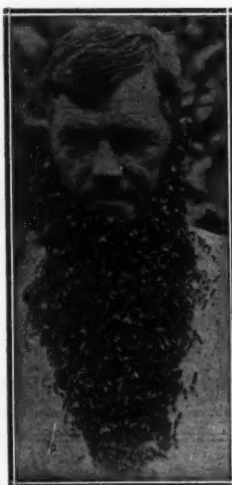
Our breeding queens are backed by over 50 years' experience in breeding good queens.

Untested	75c each	Tested	\$2.00 each
Select untested	\$1.00 each	Breeders	\$5.00 to \$15.00 each
Pound packages, shipped on comb foundation.			
		Nuclei	
1-lb. package, no queen	\$2.00	1-frame, no queen	\$2.00
2-lb. package, no queen	\$3.75	2-frame, no queen	\$3.75
3-lb. package, no queen	\$5.25	3-frame, no queen	\$5.25

Special prices on large orders and contracts.

Root quality bee supplies. We are the bargain house for Southern beekeepers. It will pay you to get our Catalog and Prices.

THE SOUTHLAND APIARIES, Hattiesburg, Miss.



QUEENS

I hope you will send in your order for some of our High Grade Italian Queens and become one of the large number of our satisfied customers. We are now enjoying a light honey flow from blue vine, making the conditions ideal for producing the very best queens. In addition to this, we give the larvæ the right start in the swarm box and finish the cells in powerful colonies, so populous as to crowd a two-story Jumbo hive. Cells are given to strong nuclei, and the young virgin receives the best care at all times. No queens are hatched in nursery cages. I give the fullest guarantee with every queen sent out, and will gladly replace any that proves other than first-class. If the present favorable weather continues, I will be able to make prompt shipments..

OUR GUARANTEE: I guarantee pure mating, safe arrival, and that all queens shall be first class, leaving it to the customer to be the judge.

Half Way Tree P. O., Jamaica, B. W. I.

"Dear Mr. Smith: Received the queen you sent all O. K. She is just splendid and vigorous. I have nearly finished requeening my apiary with the stock I bought from you last year. Their progeny are true to type and color, laying so profusely that I shall have to give them another super besides the brood chamber in which to lay. I must say again how satisfied I am. Very faithfully, Otto Holt."

Price List for the Remainder of the Season:

One to four, inclusive	-----	\$2.00 each
Five to nine, inclusive	-----	1.95 each
Ten or more	-----	1.90 each
Our very best breeders	-----	12.00 each

JAY SMITH, Vincennes, Ind.

RT. 3

SLUM GUM AND OLD COMBS

Worked into beeswax at 5c per pound, minimum charge \$1.00. Pay taken from wax

Market price paid for the wax, worked into foundation or trade for supplies.

Working beeswax into foundation is a specialty with us.

Ship to Falconer, N. Y. Mark each package with your name and address both inside and outside.

Write for red catalog of beekeepers supplies and REDUCED price list.

W. T. FALCONER MFG. COMPANY, Falconer, N. Y., U. S. A.

"Where the good Beehives come from"

GOLDEN ITALIAN QUEENS

	Nov. 1 to June 1			June 1 to Nov. 1		
	1	6	12	1	6	12
Untested	\$2.00	\$ 9.00	\$16.80	\$1.50	\$ 8.00	\$14.50
Select Untested	2.25	10.50	18.00	2.00	9.50	16.00
Tested	4.00	22.50	40.00	3.50	10.50	36.00
Select Tested	4.50	25.00	45.00	4.00	22.50	40.00

BREEDERS \$12.50 TO \$25.00

10 per cent additional for Exported Queens. Queens for Export will be carefully packed in long distance cages, but safe delivery is not guaranteed.

NO NUCLEI, FULL COLONIES OR POUND PACKAGES.

BEN G. DAVIS, Spring Hill, Tenn.

BARNES' FOOTPOWER MACHINERY

Read what J. E. Parent, of Chariton, N. Y. says:

"We cut with one of your Combined Machines last winter 50 chaff hives with 7-in. cap, 100 honey-racks, 500 frames and a great deal of other work."



W. F. & JOHN BARNES
995 Ruby St., ROCKFORD, ILLINOIS

Crop and Market Report

Compiled by M. G. Dadant

Conditions have not changed materially since our last report was issued in August, except that the last few days of July were continued dry, resulting in a minimum of honey storage by the bees.

Reports would seem to indicate that New England will have a fair crop, though hardly up to last year. New York and Pennsylvania reports are spotted, some being good and many very poor. On the whole, these States will do well to average 75 per cent of last year. The crop in the Virginias and Carolinas has been very poor, while Georgia and Florida have had a fair crop. Alabama and Mississippi have a much better crop than last year, due to the fact that sweet clover produced well. Tennessee and Kentucky reports vary, as do those from Arkansas and Oklahoma. Louisiana has had a very heavy flow, though late.

Ohio seems to be having a bumper crop, and Indiana will be at least up to normal. Michigan will probably produce as much as last year, with Wisconsin 50 per cent and Minnesota 25 per cent. Even in South Dakota and Western Iowa, the crop was cut much by drought, while Kansas and Nebraska reports are very good.

The Illinois crop is nil and Missouri only fair, except in the western part. Texas started off badly, but is making up now and will possibly have as much as in 1920. The inter-mountain territory reports are not flattering. Neither this section nor Utah and Nevada will have the crop harvested in 1920.

New Mexico and Arizona are having good flows, probably normal. Washington will be below average, with Oregon probably normal. Northern California, which promised well, is short, but not as short as Southern California. On the whole, prospects are that unless the balance of the season does exceedingly well it is doubtful if there will be over 60 to 70 per cent as much honey produced as in 1920.

CROP PROSPECTS

Fortunately, late rains have added interest to the balance of the season, though in most instances the rains came so late that they will affect the white crop but little. The whole of the Central West has had bountiful rains and fall flow regions seem hopeful. In our own locality, hardly a pound of white spring honey was harvested outside of the bees' needs, but fall pasturage looks good and the bees are already showing a good surplus. It is doubtful, however, the country over, whether the fall flows will exceed 1920. On the whole, we do not see how they can affect the general average very much.

JULY CROP REPORTER

The July Crop Reporter of the Department of Agriculture shows an average of 22 pounds per colony up to July 1, compared to 25 pounds last year, or 90 per cent. This is hardly a comparison that will do to use at this late

date, however, since the July drought certainly cut the average down greatly. The next report issued should show a greater divergence between the two years.

On July 1 the condition of honey plants was 85 per cent of normal and condition of colonies 78 per cent of normal.

THE LEWIS REPORT

The G. B. Lewis Company have issued an independent report under date of August 1, based on reports received July 21. These show the crop up to July 21 as being 40 per cent of last year, with 39 per cent of the crop still in prospect. These figures will check up very well with our own. They give condition of bees at 88 per cent of normal.

ONTARIO CROP REPORT

The Ontario light honey report is out. Replies were received from 442 members owning 21,000 colonies of bees with a total crop of one and one-half million pounds, or a per colony average of about 75 pounds, somewhat better than last year.

Their committee recommends a wholesale price on white extracted of 15 to 18 cents; retail 20 to 25 cents. Recommended prices for comb are: No. 1, \$5 to \$7 per case; No. 2, \$3.50 to \$5 per case.

HONEY SALES AND PRICES

The last week or two have seen an impetus to the demand for honey, with the result that there has been a stiffening in price of the white grades in a jobbing way. Orange prices are higher and white clover and alfalfa show signs of activity. Producers seem a little less inclined to sacrifice in order to induce sales. Amber honeys, however, still show the effects of the competition of foreign honeys, with the result that amber alfalfa is quoted on the Pacific Coast as low as 5 1/4 cents.

The attitude of producers is encouraging. Evidently the intimation that the tariff revision would soon see in effect a duty on honey and the fact that the fruit is scarce this year, has helped encourage the producing class.

The writer has just finished reading the last issue of "The Packer," probably the most authoritative weekly paper on fruit conditions. The striking feature was the report of short fruit crops from almost all sections except the inter-mountain territory and Oregon and Washington, which may have normal crops. Certainly the fruit crop is going to be very short, and if the beekeepers take advantage of their opportunity by advertising honey, the crop of 1921 should move readily and at good prices. At least we see no reason for rushing honey to market unless prices are satisfactory.

Comb honey is in good demand and should command a remunerative price.

10,299 ITALIAN QUEENS

Reared and sold to August first this season. Our efforts shall always be to furnish as many customers as possible the best Italian Queens at the least possible price.

Untested, 1 to 12.....	\$1.00 each
Untested, 12 or more.....	.75 each
Tested, 1 to 12.....	2.00 each
Tested, 12 or more.....	1.50 each
Breeders.....	\$5.00 to 25.00 each

Return dead and unsatisfactory queens. Can save you money on Cypress Bee Supplies.

THE STOVER APIARIES, MAYHEW, MISSISSIPPI

HONEY

All sweets have experienced sensational declines

The world's supply of sugar is estimated at 1,250,000 tons in excess of requirements.

If you have honey, sell it early. If you cannot sell it, WE CAN.

Write us and send samples.

MONEY for HONEY

PATON & COWELL

No. 217 Broadway, New York, N. Y.

CALIFORNIA ITALIAN QUEENS

The old reliable three-band stock that delivers the goods. This stock is descendant from the A. I. Root Co.'s best breeders. Then the J. P. Moore long tongue, red clover strain was added. Next some of Doolittle's famous stock was secured, one breeder in particular, one which was selected by Mr. Doolittle himself and caged with his own hands a short time before his death, proved extra remarkable. This season the Jay Smith strain has been secured, and these are proving equal, if not superior, to anything I have ever seen. In order to keep running to maximum capacity till fall, I am offering

SPECIAL PRICES FOR JUNE, JULY, AUGUST AND SEPTEMBER

Delivery June 15 to October 1, for orders booked in advance:

Select Untested	1, \$1.25; 6, \$7.00; 12, \$13.00; 25 to 50, \$1 each; 100, 90c each
Tested	1, \$1.75; 6, \$10.00; 12, \$18.00
Superior breeder, 1 year old, \$5.00	

Every queen actually laying before being caged, and fully guaranteed. I also guarantee safe arrival in United States and Canada. Circular free.

155 SCHIELE ST.

J. E. WING

SAN JOSE, CAL.



QUEENS



Select Three-Banded Italians of the highest quality (one grade)
Eight hundred honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

PRICES

For 1 untested \$1.00; for 6, \$5 50; for 12 or more, \$10.00 per dozen
Tested queens \$2.00 each

A new customer from Missouri, where you have to show them, writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw." (Name on request.) Another one, from the same state, writes: "Your 100 2-lb. packages averaged over 90 pounds surplus honey per colony; 10 pounds more per colony than the other 2-lb. packages purchased elsewhere." H. H. THALE, Durham, Mo.

Now listen to this, from Ontario, Canada: "Bees and queens purchased of you last season all wintered without a single loss. Save me 50 untested queens for May delivery." (Name on request.)

My customers say my queens stand the northern winters. They are bred up for this purpose, combined with the highest honey-gathering qualities and prolificness.

Pure mating, safe arrival, and satisfaction guaranteed. It is left with customer to say what is satisfaction.

JASPER KNIGHT, Hayneville, Alabama

OUR BACKDOOR NEIGHBORS

BY FRANK C. PELLETT

A book of fascinating stories of animal life. Will delight the children and please the grown folks. Illustrated with many photographs from life.

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HAMILTON, ILL.

BEEKEEPERS WE MANUFACTURE DOVETAILED HIVES, HOFFMAN FRAMES, SECTIONS AND SHIPPING CASES

Our hives are made of best grade White Pine, cut accurate and smooth to standard measure. Sections are made of Basswood polished on both sides. There are no better made.

We carry a complete line of everything used in the apiary. Our shipping facilities are as good as can be found anywhere. We want your business. We guarantee prompt and satisfactory service. Price list free.

MARSHFIELD MANUFACTURING COMPANY, Marshfield, Wis.

QUEENS, THREE-BAND ITALIANS BRED FOR BUSINESS

Only one grade—select. Satisfaction guaranteed

	1	12	25 to 50	100
Untested.....	\$1.00	\$10.80	\$.80 ea.	\$70.00
Tested.....	1.75	18.00		

A two-pound package of bees and untested queen \$4.75. 25 or more packages \$4.50 each

CANEY VALLEY APIARIES, J. D. Yancey, Mgr.
BAY CITY, TEXAS



Books on Beekeeping

First Lessons in Beekeeping, by C. P. Dadant. 167 pages, 178 illustrations. Cloth \$1.

Dadant System of Beekeeping, by C. P. Dadant. 118 pages, 58 illustrations. Cloth \$1.

The Honeybee, by Langstroth and Dadant. 575 pages, 229 illustrations. Cloth \$2.50.

Outapiaries, by M. G. Dadant. 125 pages, 50 illustrations. Cloth \$1.

1000 Answers to Beekeeping Questions, by C. C. Miller. 276 pages, illustrated. Cloth \$1.25.

American Honey Plants, by Frank C. Pellett. 300 large pages, 155 illustrations. Cloth \$2.50.

Practical Queen Rearing, by Frank C. Pellett. 105 pages, 40 illustrations. \$1.00.

Productive Beekeeping, by Frank C. Pellett. 326 pages, 134 illustrations. Cloth \$2.50.

Beginner's Bee Book, by Frank C. Pellett. 179 pages, illustrated. Cloth \$1.25.

Beekeeping in the South, by Kenneth Hawkins. 120 pages, 58 illustrations. Cloth \$1.25.

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AMERICA'S *Greatest Corporations*

have learned the expediency of planning their policies for many years ahead. This is one of the reasons why these stalwart enterprises go right on expanding through all sorts of business weather.

Mr. O. J. Jones, of Wichita, Kansas, not only plans ahead, but plans well. He is a well-known Kansas beekeeper and President of the State Beekeepers' Association. In his letter of July 4, he tells us of one of the very vital plans of his business. He believes that the success of his business depends on good bees, and for that reason he is planning to head his apiaries with Forehand's Three Bands. This is his plan:

"I have tested out stock from your queens side by side with stock from other Southern queen breeders for the past four years. I have found yours giving much better results in almost every instance, averaging a much higher degree of efficiency. So well satisfied with the results from your stock am I that I am rearing all my queens from some very fine breeders that I have purchased from you, or their offspring."

These breeding queens were selected from some of our untested queens.

	Prices			
	1	6	12	100
Untested -----	\$1.25	\$ 6.50	\$11.50	\$0.90
Select untested---	1.50	7.50	13.50	1.00
Tested -----	2.00	10.00	18.50	
Select tested ----	2.75	15.00	27.00	

We guarantee pure mating and satisfaction the world over. Safe arrival in the United States and Canada.

W. J. FOREHAND & SONS, Ft. Deposit, Ala.

INCREASE YOUR INCOME

By Selling Your Honey at Retail

L. A. Coblenz of Idaho could get no offer above eight cents per pound for his last years crop from the bottlers. With his wife's help he sold more than 100,000 pounds direct to the consumer at current retail prices, viz: 15c per pound in sixty pound cans; 20c in ten pound pails and 22c in five pound pails.

You can do as well with the same effort. Don't ruin your future market by cutting below a living price, but put up your crop in attractive containers and sell it direct to the consumer.

We will furnish you the labels and other necessary printed matter.

Send today for our label catalog and samples of printing

AMERICAN BEE JOURNAL, HAMILTON, ILLINOIS

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That is One Argument in Favor of Cypress as a Beekeeper's Lumber



There are many qualities that make the value in lumber, depending, of course, on the uses to which they are put. But of all virtues that of **endurance** comes first. The wood that resists rot influences longest, especially when the wood is used in a service by which it is exposed to wet and dry conditions and earth contact—that wood is accredited with being able to give the user the greatest **INVESTMENT VALUE**.

No use tries the lasting qualities of lumber greater than that of Bee Hive construction. It is the very deuce to get lumber that will not too readily rot—unless one gets Cypress lumber. Then there is a good show for endurance that means **real money saved on Repairs You Don't Have to Make**. Try it, Mr. Beekeeper.

STUDY THE WOOD QUESTION

There's one way to get at this matter of endurance—through books of authority. Such are the 43 volumes of the internationally famous Cypress Pocket Library. These books are not "advertising"—they are authoritative references on file in the libraries of scores of technical schools and National institutes. Ask for Vol. 1 to start with; it contains the complete U. S. Govt. Rept. on Cypress, "The Wood Eternal," and a full list of the other volumes; then branch out until you cover the subject.

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DO YOU USE ALUMINUM HONEYCOMBS? IF NOT, WHY NOT?

Each comb is in itself a valuable asset to any apiary. It is the only comb which enables BEEKEEPERS TO OBTAIN ALL THE HONEY without waiting for the bees to draw out foundation. THEREBY SAVING TIME AND MONEY.

We can prove that no practical BEEKEEPER can afford to be without the ALUMINUM HONEYCOMB

In a recent issue of a National Bee Publication the following question and its answer appeared:

Q. What is the total cost of a fully drawn out wax comb?

A. The minimum cost of drawing out a wax comb is 50 cents.

PRACTICAL BEEKEEPERS are buying ALUMINUM HONEYCOMBS because they

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| Cannot be destroyed by moths or rodents | Prevent loss by melting |
| Make extracting of honey easy | Increase production |
| Control production of drones | Last forever with reasonable care |
| Can be sterilized | Cost no more than wax combs |

THE DIAMOND MATCH CO., Apiary Dept., CHICO, CAL.
Sole distributors for DUFFY-DIEHL, Inc., Pasadena, Cal.

Quality in Your Bee Supplies Is Money in Your Pocket

If you own twenty or two hundred hives, quality bee supplies will save you a very considerable amount of time thru easy handling, freedom from accidents, and freedom from breakage.

As a commercial beekeeper, we will suppose you handle two hundred colonies. For the best results you would like to examine each of your hundred colonies every ten days during the honey flow. For success in honey production is the result of intensive and efficient management.

Root's Quality equipment in the apiary handling will save you at least one minute per hive as compared with the time necessary to handle cheaper equipment. Figuring one minute for each of two hundred colonies, the time saved totals three hours and twenty minutes each ten day period.

This three hours and twenty minutes will provide additional time to take care of at least five additional hives.

The income from these five additional hives will most certainly pay a very good return on the investment you may have in quality equipment.

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Save time and labor.

Complete your equipment now, and insist on your dealer furnishing Root goods.

Prices are right.

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Special CONTAINER PRICE LIST

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